



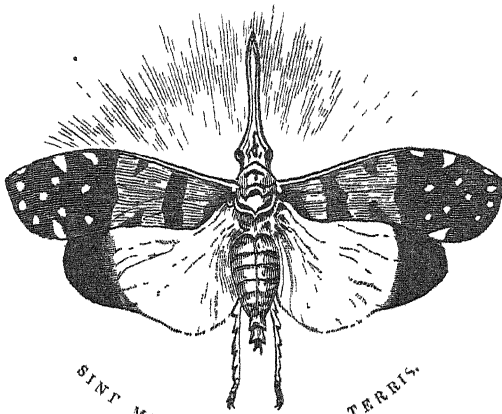
AGRICULTURAL RESEARCH INSTITUTE

PUSA

THE

ENTOMOLOGICAL MAGAZINE.

VOL. II.



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WAUGH & INNES, EDINBURGH; AND W. F. WAKEMAN, DUBLIN.

M DCCCXXXIV.

"Truth must be sought with a pure and simple heart; it is only to be found in nature, and it should be communicated only to good men."

CHATEAUBRIAND.

"The philosopher has conferred on the moralist an obligation of surpassing weight. In unveiling to him the living miracles which teem in rich exuberance around the minutest atom, as well as throughout the largest masses of ever-active matter, he has placed before him resistless evidence of immeasurable design."

BABBAGE.

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PLATE V.—See ART. VI.

- Fig. 1. Skull of *Hydrous piceus*, upper side.
 2. Ditto ditto, lower side.
 3. Head of ditto.
 4. Mandible of ditto.
 5. Maxilla of ditto.
 6. Labium of ditto.
 7. Antennæ of ditto.
 8. Labrum of ditto.
 9. Maxilla of *Melolontha vulgaris*.
 10. Ditto *Acilius sulcatus*.
 11. Ditto *Cychrus rostratus*.
 12. Ditto *Acheta domestica*.
 13. Ditto *Perla bicandata*.
 14. Ditto *Trichiosoma lucorum*.
 15. Skull of *Æschna maculatissima*.
 16. Ditto *Vespa Crabro*.

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- Fig. 1. Labrum and mandibles of *Amaryssus Machaon*, (from Savigny.)
 2. Ditto ditto *Vanessa Cardui*, (from ditto.)
 3. Ditto ditto *Pontia Daplidice*, (from ditto.)
 4. Ditto ditto *Zygæna Scabiosæ*, (from ditto.)
 5. Head of *Crambus cannarum*, (from ditto.)
 6. Maxilla of *Zygæna Scabiosæ*, (from ditto.)
 7. Ditto *Crambus cannarum*, (from ditto.)
 8. Ditto *Pontia Daplidice*, (from ditto.)
 9. Labium of *Crambus cannarum*, (from ditto.)
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- Fig. 1. *Rhipipteryx Marginatas*.
 2. Mouth of ditto.
 3. Skull of ditto.
 4. Hind-leg of ditto.
 5. Fore-leg of ditto.
 6. Telum, &c., of ditto.
 7. Antenna of ditto.

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Æ. Epicranium.
 æ. Clypeus.
 œ. Ocelli.
 Æ. Gula.
 æ. Mentum.
 Œ. Oculi.
 y. Antenna.
 j. Mouth.
 α. Labrum.
 e. Lingua.
 i. Mandible.
 o. Maxilla.

o. 1. Insertio of Maxilla.
 o. 2. Maxilla proper.
 o. 3. Palpifer of Maxilla.
 o. 4. Lacina of ditto.
 ö. Galea.
 ö. Maxipalpus.
 u. Labium.
 u. 1. Insertio of Labium.
 u. 2. Labium proper.
 u. 3. Palpifer of Labium.
 u. 4. Ligula.
 ä. Labipalpus.

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PLATE VIII. *Deilephila Euphorbiæ*.

Middle figure, male; lower figure, female; upper figure, under side.

PLATE IX. *Deilephila Euphorbiæ*.

Eggs; *Euphorbia Paralias*, with newly-hatched larvæ; larva 5 weeks old, uncoloured; full-grown larva; pupa.

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*List of Subscribers for Five Copies of this Volume, to whom we
return our most sincere thanks.*

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INTRODUCTION.

IN presenting the Second Volume of our Magazine to the public, we feel ourselves called upon to express our gratitude for the liberal support which it owes to our Subscribers, and for the valuable contributions with which they have enriched it.

We are particularly indebted to Mr. Ingall and Mr. Raddon: the former engraves gratuitously for the Magazine, and the latter has presented us this year with two beautiful plates illustrating *Deilephila Euphorbiæ*.

We are delighted to observe the increasing regard for the study of insects, which is sufficiently manifested by the Entomological Societies both at home and abroad. The Entomological Society of London, warmly advocated in its progress by this Magazine, has arrived at a degree of prosperity never previously attained by an Entomological Society in this country, although so many have been formed. The first part of the Transactions of this Society has already been published in a neat and compendious form, embellished with seven copper-plate engravings, and is a work well worthy the attention of entomologists. The Entomological Society of France, contemporaneous with that in which this Magazine originated, has continued publishing quarterly numbers, keeping pace with our own, and containing papers of great and rare merit.

We trust that we have maintained the promises given in the Introduction to our First Volume. We have alternated our scientific essays with many of a popular character, or of public utility. Our pages are free from party feeling; and in our judgments we have been regardless of the approbation or displeasure of others.

Both the periodical publications on British Entomology so often commended in our pages are continued with regularity and with wonted utility and beauty. We recommend Mr. Swainson's "Discourse on the Study of Natural History" (lately published in "Lardner's Cyclopædia") to the attention of entomologists; it is well worthy their perusal. Among the entomological works announced for publication, we may mention "A Grammar of Entomology," by Mr. Newman; a similar work proposed by Mr. G. R. Gray; a volume on Genera, by Mr. Westwood; "An Essay on the British Fossorial Hymenoptera," by Mr. Shuckhard; a second edition of Dr. Bevan's "Honey Bee;" and also of Mr. Samouelle's "Entomologist's Useful Compendium," &c. &c. On the continent, Leon Dufour's "Recherches sur les Hémiptères," and Pictet's admirable "Recherches sur les Phryganides," deserve our highest praise. Perty "On the Insects collected in Brazil by Spix and Martius;" Klug's "Symbolæ Physicæ, or an Account of the Insects collected in Northern Africa and Occidental Asia by Hemprich and Ehrenberg;" and the Atlas to the "Voyage de la Coquille," are all splendidly illustrated folio works. Professor Gravenhorst, so justly celebrated for his "Ichneumonologia Europæa," is about to publish descriptions of the *Staphilinites*. Nees ab Essenbeck has issued a second edition of his "Ichneumones Adsciti." Lastly, some valuable observations on the *Tenthredinites* and the *Histerites*, with characters of many genera and species before undescribed, will be found in Klug's work on the Insects in the Royal Museum at Berlin.

We may add, that the increased, and still increasing, circulation of the Entomological Magazine, renders its continuance a matter of certainty. It was not projected as a source of profit, nor has it hitherto yielded any; what little may accrue will be instantly expended in the colouring of plates, the engraving of wood-cuts, or any other manner that may be deemed acceptable to our Subscribers.

THE
ENTOMOLOGICAL MAGAZINE.

JANUARY, 1834.

ART. I.—*Colloquia Entomologica.*

Γνωθι σεαυτον.

SCENE—*The Parlour at the Bull Inn, Birch-wood-corner.*

VENATOR, AMBULATOR, ENTOMOPHILUS, and ERRO, seated
at a round table.

[*Argument.*—They extol each other's contributions to the first volume of the Fire-fly: they bewail the opposition made to the Fire-fly: they hope for better times: the conversation turneth—they speak of the Entomological Society: the conversation turneth again—they speak of Rusticus, of Mr. Yarrell, of Dr. Grant, of Mr. Bell, of Mr. Kirby, of Dr. Leach, of Mr. MacLeay, of Mr. Curtis, of Mr. Charles Curtis, of Mr. Stephens: the conversation again turneth—they elect an Editor for the second volume of the Fire-fly: the retiring Editor chargeth the Editor-elect. *Corderius secundus.*]

VENATOR. I've been thinking——

ENTOMOPHILUS. I saw you were fatigued.

ERRO. He! he! that's too bad:—Moffy supposes no one has a right to think but himself.

AMBULATOR. Yes. I overheard Chrysis-cyanea congratulate him on having entered the field of thought, and ever since——

ERRO. Now that's a shame—nobody knows who I meant by Chrysis-cyanea.

VEN. Nobody does *not* know—if ever you let out who the triangle belongs to, you may expect a challenge from more than one.

ENT. What does the triangle mean, Am.?

AMB. His own initial, to be sure, D; sometimes he signs double D.

VEN. In exposures, and those kind of things, the D to be pronounced broad, as in the French.

ENT. Roey—*was* that you?

VEN. As sure as my name's ———.

ENT. Oh! very well, very well; I'll expose the fallacy of the triangle next number.

ERRO. It's all their nonsense! I should have been ashamed to have written it.

AMB. Never mind 'em, Mr. Moffy, I intend to read Sphinx Vespiformis myself this winter; I have tried a dozen times, but I always fall asleep over it.

ERRO. It had rather that effect on me.

ENT. A proof of its value. I am sometimes rather restless in the night, and then I open the Magazine at Chalcy or Straus, and either sends me off like an opiate. I keep the Mag. by the bed-side for the purpose.

AMB. The medical properties of Clericus and double D, I should imagine, to be sudorific.

ERRO. And Osteology occasions cough, by sticking in the trachea:—but John Curtis has put an extinguisher on that.

ENT. The Osteology's nothing to me; one of ———'s writers say it isn't mine.

ERRO. What envious mortal has done that?

AMB. Who does he say wrote it, then?

ENT. Haliday.

VEN. Haliday! he'll very soon set that at rest; Haliday's one of the most honourable men I know.

ENT. I think he'll look queerish, when he sees all my rigmarole fathered upon him.

AMB. What shall you do?

ENT. Do! nothing! laugh and grow fat.

ERRO. I say, Ambulator,—(*leaning across the table*)—

Parca non mendax dedit et malignum
Spernere vulgus.

ENT. How does that run in the vernacular?

AMB. Something in this way:—

Th' indulgent fates to you have given
A glorious boon, a boon of heaven,
A joyous soul, that laughs to scorn
The envy of the lowly born.

VEN. Capital!—good!—very good!

ENT. Born! Pedigree has nothing to do with it.

ERRO. Verbatim. The *malignum vulgus* requires *that*. I never could string two lines of rhyme together.

AMB. What! Yes, Osteology was only a kind of prop to Sphinx Vespiformis, a buttress to support it a little longer—it must fall. I agree with double D, in thinking we are too fond of theory; what he says is very good.

ERRO. Yes, Doctor Dichotomy's right enough; it's all true.

VEN. What unmerciful fellows; I'm right glad you have not me to quiz. Why, you have offended half the publishing entomologists in England, without a quarter of the lashing you give one another.

AMB. Oh! no, not offended. We have never ventured beyond fair criticism. No one would lower himself by taking offence at fair criticism.

ERRO. We hold up our Fire-fly to enlighten them; it's all intended kindly; they can't have any reason to be enraged.

AMB. Neither had the jailers of poor Mary; yet, who was so ill-treated? the light of her lovely countenance, turned on them, seemed to demonize them.

ENT. Why not give that in verse.

Languidly over the water,
Each echoing bugle-note
Gave warning, to Scotia's daughter,
Of cruel oppressor's boat.

And so with our lovely rover,
The voice of each favoured sage
She illumined in passing over
Repay for her light with rage.

AMB. Pretty.

ENT. Venator, we wait.

ERRO. He's glad enough to quit the subject of theory—you—

ENT. Theory, theory! by constant bandying from mouth to mouth, the gloss of the originality, of the outcry against it, begins to wear off;—down with theory, down with theory! Give us facts, we want facts! poor fools!—Come, Venator, begin, “Unaccustomed as I am”—

VEN. Gentlemen, our loyalty being unquestionable, we need not waste words in displaying it. With your leave, let us begin with “Success to the Fire-fly, and good-will to her

opponents;" for we all know that we have been severe, very severe; let us, therefore, recollect this, and not resent or notice those little ebullitions of ill-feeling towards us, which our own criticisms have called forth. I find that individuals expected that we should notice nothing but attacks upon ourselves, that no crime against the public was to come under our notice; our plan in this respect is now better known: we have shown our impartiality, and not only returned measure for measure, but have given handsome interest into the bargain—the warning will be salutary. The operations going on against us, both privately and publicly, are evident; but let us appear not to see them. No; let us do even more than that; let us select some two or three of the most active of our enemies, and say every good of them that we can, consistently with truth; that will be a noble revenge. Gentlemen, "Success to the Fire-fly, and good-will to her opponents."

OMNES. Excellent. "Success," &c.

AMB. I think that we have found that it would be wiser to refrain in future from expressing any opinion on the affairs of others, when unconnected with science; some of my entomological friends have thought we had better not have interfered in a recent case, not on account of our observations being undeserved, but because the matter was below our jurisdiction.

ERRO. And then we should have been loudly and fairly charged with partiality.

Incidit in Scyllam qui vult vitare Charybdim.

VEN. We could have done no other than we have done, without laying ourselves open to that charge which would be the most injurious of all: depend upon it, we are right as far as we have gone. Now, if you please, conciliate.

AMB. Don't you think we shall find that very difficult? we have certainly done nothing yet to allay the feeling against which we have declared war; but really, I think, we have made matters worse. We seem to have raised a storm we cannot control; the waves of opposition threaten the Fire-fly on all sides.

ERRO. Down she must go—

Ast illam ter fluctus ibidem,

Torquet agens circum, et rapidus vorat æquore vortex.

AMB. I hope not—

Excutitur pronusque magister
Volvitur in caput.

ENT. English only, to-night.

ERRO. They'll shake the captain by the collar, and then give him a thump of the head. I see Chry—

ENT. Very elegant, indeed!

ERRO. —sis-cyanea has imitated my *monstror*.

AMB. Yes, and aped Rusticus.

ERRO. What profanation!

VEN. No, no, it won't come to that.

AMB. What!

ENT. I agree with you about disregarding all attacks, aye, even returning good for evil; but we must persevere in well-doing. Ambulator observes, we can't control the storm; what of that? does not the sun illumine that ocean whose restless waves he has no power to allay?

ERRO.—

Like moonlight on a troubled sea,
Brightening the storm it cannot calm.

ENT. And shall our Fire-fly refuse her ray to enlighten a science whose votaries are at war? Never, never! Let them oppose her; let them speak evil of her; let them go about persuading others to mutiny, and desert her: heed them not; they shall not prevail against her, while her rays are the rays of genius, her light the light of truth.

VEN. I believe it; people don't like to be told that they ought to see the difference; that there is a want of the merit it promised at first, and so on. It is very difficult to mislead those who really read; they like to judge for themselves.

ENT. And wherefore should they not? man is an inquiring animal; his mind, perchance, may wander, perchance may waver, perchance may bend from its own weakness, may be lured by interest, warped by pride, case-hardened by obstinacy, blinded by ambition,—but these are the exceptions: believe me, the mind of man naturally, instinctively, aye unwittingly, turns towards the truth, as a sun-flower towards the sun.

AMB. I hope we shall find it so; indeed, I believe it; I think too well of mankind to doubt it; and we need not mind about these little troubles, if we triumph at last.

VEN. Trouble does not harm us; it very often teaches us wisdom.

ERRO. But it weighs us down by a perpetual weight, and teaches us unhappiness also.

ENT. Trouble, in harrowing the soul, also chastens and enriches it, as the balmy breezes of Arabia, in breaking up the surface of the Red Sea into multitudinous billows, impregnate it with their perfume. But, as for the Fire-fly, trouble will do her no harm; she will float, like the petrel, securely on the roughest sea. Opposition may assail her and threaten her, as the clanging blast of brazen trumpets, or as the lurid painted pile of sunset clouds, staining ocean with their lustre; yet shall it shortly, surely cease, from its want of power to exist, as those trumpet-notes melt into nothingness among the hills, or as those clouds,—like the cities of the island of Atalantis sinking turret after turret, dome after dome, below the insatiable waters,—subside beneath the sea-girt horizon.

VEN. Mr. Entomophilus, we wait.

ENT. "Success to the Entomological Society."

OMNES. "Success," &c.

AMB. I am glad to see the Society in such a thriving condition; at first I was rather fearful there was a little spirit of opposition to us, but I was soon undeceived on that head.

ERRO. What a delightful scene it was, when that dear old man took the chair, and the whole room rang with applause; he would have spoken, but his emotion was too great,—*vox faucibus hæsit*; he would have bowed to us, but he had lost the power; his feelings conquered him, and he sank back into his seat, voiceless and unmanned. I wonder how many of the present race of entomologists will live to be so greeted. I would not, for the world, have lost that meeting.

VEN. What becomes now of the idea that the Society is the offspring of a party?

ERRO. It would be a good bit of fun to talk to them about it now:—The *party*-Society met, &c.; Kirby in the chair; Ambulator, Venator, and I, standing behind him; Children, Spence, Entomophilus, Blomer, Bennett, Waterhouse, &c. round the table; and crowded benches of entomoes filling up the room, dotted here and there with a Horsfield, a Yarrell, a Stephens, a Sykes, a Bowerbank—

VEN. Better avoid it, the sarcasm would be too biting: a *party*, headed by Kirby, Spence, Children, Horsfield, Yarrel, and Sykes!!

ENT. How infinitely ridiculous! I know no men more completely above all such paltry feeling.

VEN. Nothing can possibly be more liberal, than the mode in which the affairs of the Society have been conducted. One thing we must insist on—collection and library—before any publication is thought of.

ERRO. I understand that there are some members publication mad. I was told of a paper, ready cut and dried, by our friend Chrysis-cyanea, as Ambulator terms him; as it was about myself, I obtained a copy of the title, (*reads from a slip of paper.*) “Notes upon the impropriety of Mr. —’s placing the double dot over the u in Straus, and omitting it over the u in Durckheim, at page — of the Entomological Magazine; together with philosophical remarks upon the affinities of my new genus Hypothenemanogarthroides, by A. E. J. —, Esq. F.L.S. &c.”

VEN. An excellent quiz.

ENT. It is the rock on which the Society will probably split. I have induced ten individuals to join the Society; all, except one of whom, inquired whether we should publish that kind of rubbish. I assured them not.

AMB. The president is a man of sense, and a man of spirit; —he never will—

ENT. Some thanks to me for proposing him. Eh?

VEN. Yes: the Society owes you a vote of thanks. There is no individual in England so well adapted for the chair.

AMB. He never will encourage such rubbish.

ENT. Not he:—Come, Ambulator, we wait.

AMB. What?—Me?—Oh!—“Success to the Study of the Economy of Nature.”

OMNES. “Success,” &c.

AMB. I shall be understood as expressing my admiration of the great revealer of Nature’s secrets, when I merely say, Success to that branch of our study. I can imagine nothing more beautiful in poetry than the first of his Sapphics.

Hued like a rainbow, &c.

is exquisite.

ERRO. The sentiments are beautiful; but I don't like Sapphics altogether; I was made read them at school, and, *par consequence*, don't much like them now I've left; and, it's my opinion, Sapphics don't do for the English language. There is one part, the last verse I think it is—

AMB.—

No! Like these creatures, trouble, toil, and prison,
Chequer his pathway to a bright hereafter,
When he shall mount him to the happy regions,
Made to receive him.

ERRO. It is that alone makes life worth living for — the belief in *that*; there is but little on this earth—

ENT. Pish! Excuse me, Roey. I must stop that strain. Melancholy, avaunt! This earth has lots of flowers worth plucking, and you can find them as easily as any one.

VEN. How any one, with his stores of knowledge, can indulge in that stupid, nervous, Byronic kind of misanthropy, I can't think.

ENT. A contented mind, like the rosy morning sun, tinges every earthly object with its own beauteous hue, bathes in sunshine the face of universal nature: fame is not honourable; the bad attain it as easily as the good; and riches, to me, seem scarcely to gild the future more than the present.

AMB. But fancy does paint for us a future brighter than the present, though beyond the reach of riches, or any earthly gratification.

ENT. Alas, fancy has no pinions that will bear us beyond the tomb!

VEN. We have wandered into a useless discussion from talking of the Sapphics of Rusticus. As Erro observes, they will not do for English. I shewed them to my friend Dr. S——, who I consider an excellent judge; he acknowledged they were full of beauty, and as good as English Sapphics could be; but the fact is, Sapphics do not suit the genius of our language.

ENT. Genius of our language! Not suit the genius of those people who have no genius, I take you to mean. Oh, Genius, thou undefined and undefinable creature!—thou art not talent, nor wisdom, nor learning! What art thou, then, airy being, that floatest around and about and above us, instantaneously wafting from thy bright—thy ambrosial wing—to

some selected favourite, a thought, that others might ponder for in vain; anon, lighting up the eye of sorrow like sunshine in a shower? Where is thy site, and where thy home? Oh, give me wings, that I may mount up above the—

AMB. —heads of common men!

ERRO. Yet I have seen genius weighing like an incubus on trembling brains, till all was dark; or, if the eye retained the power to flash, flashing in mockery.

VEN. Mr. Erro, I believe we wait for you.

ERRO. I must adopt your plan, and wish—"Success to the Study of Zoology."

OMNES. "Success to the Study of Zoology."

AMB. The mind does not point to a single individual so forcibly as in the former instances.

ERRO. I intended the compliment, if from me it is one, to three of our countrymen.

VEN. Grant, Bell, and Yarrel.

ERRO. Yes, those are the three. I don't know which stands first.

ENT. Nor I; when I reflect on the merits of either, I consider him for the time the *first*. The sterling sense and clear head of Yarrel; the indefatigable energy of the Doctor; and the accomplished accuracy of Bell, are equally to be admired: the humility with which these great men receive, and the modesty with which they impart information, must raise them high in the estimation of all who know them.

AMB. I wonder that neither Mr. Yarrel nor Mr. Bell has been elected a Professor of Zoology.

ENT. Bell would make an excellent one. What a lustre he would confer on a college!—his lectures are exquisitely clear and beautiful. I have never heard Yarrel lecture; I believe he does not. Dr. Grant's matter is sound; his style clear and concise, with just sufficient repetition to force every head, not wooden, to comprehend.

AMB. His lectures, that we attended together last winter at Bruton Street, were really admirable; but he allowed rather too little time to entomology.

VEN. Allow me the pleasure of proposing—"Success to the Study of Entomology."

OMNES. "Success," &c.

VEN. I would from courtesy exclude the present company,

otherwise a reply would be requisite. Of those not present—Kirby, Leach, and MacLeay, seem to be the most eminent.

ENT. Decidedly. But the accurate pencil of Curtis!

ERRO. Which?

ENT. The elder brother, John Curtis;—his “British Entomology” is, beyond all comparison, the most valuable work on Entomology our country has produced;—and I consider it far from being a credit to us that its circulation is so limited.

ERRO. His brother is a good artist: his drawings in Mr. Stephens’ early numbers are very beautiful; equal to any thing I know of.

ENT. We must not refuse our meed of praise to Stephens; his undertaking is a most laborious one.

AMB. Yes; I hope he will have courage to complete it.

VEN. Gentlemen;—Is it not time that we proceed to the grand business of this meeting—the appointment of an Editor for 1834?

ENT. I have the straws prepared:—Are you ready?

AMB. Oh, Mr. Entomophilus will take it again, I hope!

ENT. Not I; once in four years is quite often enough.

ERRO. I shan’t draw.

VEN. Yes, yes! Fair play!—The compact was so made at first.

ENT. Is the longest or shortest to be the lucky man?

VEN. If length decides it—the matter is easily settled.
(*Bowing to Ambulator.*)

ENT. Straws, I mean. (*Hands the straws; they draw lots.*)

ERRO. Oh, the shortest is the man! I’ll draw last. No;—pass it on.

AMB. Delta’s is the shortest.

VEN. Mr. Erro’s the man.

ERRO. It’s mine.

ENT. And the lot fell upon the triangle.

ERRO. How tiresome!

ENT. It will be capital fun for you, Roey.

ERRO. The Boys and the Frogs.

ENT. You’ll find it so pleasant, Roey!

An Editor leads an easy life;

The pleasures, believe me, are many:—

Plague, jealousy, envy, fear, and strife,

The evils—I never found any.

} *Simultaneously.*

There, one contributor sends me a new invention for catching tadpoles; another, sixteen sheets, closely written in black ink, and closely crossed in red, and wishes it set up in large type, as Mr. How-d'ye-call-him always prints in that way, and allows six guineas per sheet paid in advance, which you are respectfully requested to remit directly;—a third wants a receipt for killing fleas;—a fourth sends one for killing bugs;—a fifth selects original poetry from the Penny Magazine, at the moderate charge of one-pound-one;—a sixth gives a long tale about a monster which frightened his wife into fits, and sends the monster itself in a wine-glass, with the lid of a tobacco-box tied on the top for fear of accident,—the monster turns out to be a common honey-bee;—a seventh transmits nineteen hundred and fifty-three insects, to be named, which have been collected in sugar-bottles, but which have been duly dried in the sun, and squeezed into a tea-cup;—an eighth ingeniously economises space, by striking four on one pin, and kindly permits me to print the list when named;—a ninth questions whether the Magazine is not too large;—a tenth questions whether it is not too small; an eleventh suggests that it should be printed in twelvemo;—a twelfth recommends quarto;—a thirteenth insists on its being monthly;—a fourteenth thinks that once a year would be often enough;—a fifteenth declares it is too scientific;—a sixteenth, that it is too popular, et cetera, et ceteræ, et cetera. Oh!—

An Editor leads an easy life;
The pleasures, &c.

One author complains, that his work has been published two months, and I have not noticed it;—another, that I have pointed out his defects, and not his merits;—a third, that I have misunderstood his meaning;—a fourth, that his errors were only typographical;—seven, that I don't make enough of them;—(O, I should like to buy all the Entomologists at my valuation, and sell them at their own!)—A twelfth, that I was influenced by envy;—a thirteenth, that I espouse a party;—a fourteenth, that his philosophy deserved an analysis—which, by the way, I had tried, and found the only element, smoke;—a fifteenth looks hot at me;—a sixteenth looks cold at me;—a seventeenth looks lukewarm;—an eighteenth grumbles that I praised So-and-so's book;—a nineteenth grumbles that I did

not praise it enough. Then come a ream of errors in my last number, philosophically and argumentatively pointed out;—thirteen abusive letters for delaying publication;—twenty-one for giving worse contributors a better place;—fifteen on allowing errors to pass the press;—and forty-three on giving too much editorial matter, to the exclusion of more important and original communication; et cetera, et ceteræ, et cetera. Oh!—

An Editor leads an easy life;
The pleasures, &c.

Then the printer puts me off and off, till it comes to the last day, and I have to let half the mistakes go by after all, and have to stay in town till all the coaches are gone, and then walk all the way home through the mud, and, wet through with rain, get robbed of my watch, stopped by the police, and experience, in one night, half the miseries of human life. Well, at last, the Firefly comes out; the public beholds it, but don't touch; the publisher (*bowing across the table to VENATOR*) meets me with a most gracious smile, talks to me of his love of science, of his desire to promote the study, of my eminent qualifications, of the increasing sale, of the certainty of eventual success, of the mildness of the weather, of the hardness of the times, of the war in Portugal, of the improvements at London Bridge; and adds, *à la postscript*, as a thing of minor importance, that the Mag. has incurred a pecuniary loss of so many pounds, so many shillings, and so many pence; for which, in the pleasantest way in the world, he reminds me that I am responsible, et cetera, et ceteræ, et cetera. Oh!—

An Editor leads an easy life;
The pleasures, believe me, are many:—
Plague, jealousy, envy, fear, and strife,
The evils,—I never found any.

ERRO. Ah! there is trouble. Well, I must,—I suppose,—there ought to be some fame.

AMB. You can praise yourself, as ———— does.

ENT. Poor empty fellow!—I suppose he fancies he can trumpet loud enough for posterity to hear him!

(*They remain sitting.*)

ART. II.—*Monographia Chalciditum.* By FRANCIS
WALKER, ESQ. F.L.S.

(Continued from Vol. I. page 466.)

“ ——— the green myriads in the peopled grass.”

Family.—LEUCOPSIDÆ.

GENUS LEUCOPSIS,^a *Fabricius.*

Vespa . . *Swammerdam, Sulzer, Christ.*

Cynips . . *De la Tourette, Gmelin.*

Leucospis. *Fabricius, Gmelin, Latreille, Olivier, Villers,*
Rossi, Cuvier, Panzer, Jurine, Walckenaer,
Illiger, Spinola, Fuessly, Dalman, Klug,
Fonscolombe.

Leucopsis. *Lamarck, Dumeril.*

Corpus punctatum, supra pubescens: caput mediocre, transversum, thorace vix angustius, anticè ubi scapi insident excavatum: oculi mediocres: ocelli 3, supra verticem trigonè dispositi: antennæ maris et fem. similes, medio frontis insertæ, 14-articulatæ, clavatæ, pubescentes; scapus in canaliculo frontali receptus; flagellum subincurvum; articulus 1^{us}. s. scapus elongatus; 2^{us}. brevis, cyathiformis; 3^{us}. elongato-cyathiformis; 4^{us}. et 7 sequentes ferè lineares, latiores, breviores; 12^{us}. mediocris, apice angustior; 13^{us}. et 14^{us}. minimi, vix conspicui: labrum breve, transversum, anticè impressum: mandibulæ ferè rectæ, æquales, bidentatæ; dentes obtusi; internus brevis, latus, ferè geminus: maxillæ elongatæ, graciles, apice acuminatæ, externè pilosæ, internè apicem versus in lobum productæ bipartitum tenuem mollem ciliatum: palpi 4-articulati, filiformes; articulus 1^{us}. elongato-cyathiformis; 2^{us}. longior; 3^{us}. 2^o. brevior; 4^{us}. 2^o. longior: mentum elongatum, angustum, apice trispinosum: palpi 3-articulati, ferè filiformes, menti apicem versus inserti; articuli subclavati, 2^{us}. 1^o. brevior, 3^{us}. longior: labium ferè cordiforme, molle; anguli antici producti; margo anticus ciliatus, medio impressus: thorax ovatus: prothoracis scutellum maximum, subquadratum, anticè paullò angustius; segmenta reliqua dorsalia supra occulta; pectus parvum: mesothoracis scutum maximum;

^a Λευκὸς albus, ὀψίς facies. I think, with Dumeril, that the name of the genus is derived from these words.

parapsides scuto in unum confusæ; scutellum magnum, semicirculus; paraptera et epimera trigona; sternum magnum, medio canaliculatum: metathoracis scutellum parvum, plerumque apice bispinosum; postscutellum maximum; epimera et paraptera trigona; sternum magnum: propedes^b graciles; coxæ trigonæ, mediocres; trochanteres parvi; tibiæ paullò arcuatæ, apice latiores, et dentibus nonnullis minutis et spina elongata valida subarcuata armatæ: mesopedes longiores, graciliores; tibiæ rectæ, femoribus paullò longiores, externè basim versus impressæ; spina apicalis brevior, tenuior; cæteri propedum: metapedum coxæ maximæ, angulus internus serratus; femora maxima, ovata, externè convexa, internè plana, subtus dentibus plurimis armata; tibiæ valdè arcuatæ, subtus canaliculatæ, femoribus appressæ, apicis angulus internus productus, acuminatus; cæteri propedum: tarsi omnes subtus ciliati, articulus 1^{us}. elongatus, sequentes longitudine decrescentes, ultimus 2^o. longior; ungues arcuati, subtus basi dentibus plurimus minutis armati; pulvilli minimi: proalæ plicatæ; nervus subcostalis costam alæ medium versus attingens, et inde ferè ad apicem productus, ubi costam attingit ramulum emittens furcatum; furca antica mox abrupta; postica alæ apicem versus producta; nervus in alæ disco, brevis, insulatus; nervus 3^{us}. longitudinalis alæ basi proveniens, medio crassior, apicem versus furcatus; furcæ ambæ marginem posticum attingentes; nervus 4^{us}. marginis postici medium occupans; areolæ paucæ, apertæ, non benè determinatæ: metalæ parvæ; nervus subcostalis a basi, ubi costa jungitur, ferè ad alæ apicem productus; nervi duo longitudinales indistincti; hamus nervo subcostali ante alæ apicem insertus: abdomen sessile, elongato-ovatum, compressum, apice rotundum; *maris*, segmentum 1^{um}. magnum; 2^{um}. maximum, ferè omne abdominis dorsum occupans; 3^{um}. minimum, vix conspicuum; subtus abdomen segmenta 5 ventralia conspicua, subæqualia: *fem.* abdomen dorso ubi oviductus insidet canaliculatum; segmentum 1^{um}. maximum; 2^{um}. minimum, 1^o. ferè occultum; 3^{um}. mediocre; 4^{um}. majus, latera latiora; 5^{um}. parvum; 6^{um}. maximum, 5ⁱ. dorso recurvum, subtus quoque recurvum; subtus abdomen lamina elongata, angusta, carinata, segmenta omnia ventralia occultat: oviductus segmenti 6ⁱ. apice emersus, dorso recurvus.

These insects, in the larva state, are parasitic upon the

^b I have adopted this and similar terms, from Mr. Newman's letter on Osteology, published in Vol. I. p. 400.

mason-bees and wasps. The trophi, particularly the lingua and maxillæ, are more developed than in most *Chalcidites*.

DIVISIO I. *Metafemora subtus dentibus 8 armata.*

Sp. 1. *Leuc. grandis*.

Leucospis gigas . . *Rossi Faun. Etrusc. ed. Illiger. II.*
130; *Fonsc. Ann. Sci. Nat.* 26. 273.

Leucospis gallica . . *Rossi Mant.* 135. 298.

Leucospis dorsigera. Var. *Hochenwarth Schrift. Berl. Ges.*
VI. 341. Taf. 8. fig. 1, 2; *Christ.*
Bienen. 225. Tab. 19. fig. 9.

Leucospis grandis . *Klug. Act. Nat. Cur. Berl.* VI. 66. 1.

Sp. 2. *Leuc. gigas*. Mas et fem. *Nigra, flava variegata,*
prothoracis scutello flavo marginato, mesoscuti dorso
bimaculato, oviductu abdominis basim non attingente.

Cynips nigra, &c. . . *De la Tourette Acad. des Sci.* 9. 730.
fig. 1—5.

Cynips lugdunæa . . *Gmel.* 1. 5. 2653. 26.

Sphex dorsigera . . *Sulzer. Gesch.* 196. Tab. 27. fig. 11.

Leucospis dorsigera. *Fabr. Syst. Ent.* 361. 1; *Spec. Ins.*
1. 457. 1; *Mant. Ins.* 1. 284. 1;
Gmel. 2739. 1; *Oliv. Encyclop.*
Hist. Nat. Ins. VII. 352. 1. Pl. 100.
fig. 8. 9; *Fuessly Archiv.* 2. Tab.
18. 51. fig. 1—10.

Leucospis gallica . . *De Villers Ent.* III. 261. Tab. 8.
fig. 18.

Leucospis gigas . . . *Fabr. Ent. Syst.* II. 245. 1; *Syst.*
Piezat. 168. 1.; *Panz. Faun. Ins.*
Germ. 84. Tab. 17. 18.; *Coqueb.*
Illustr. Icon. I. 23. Tab. 6. fig. 1.;
Spin. Ins. Lig. fascic. 1. 63.; *Latr.*
Hist. Nat. des Ins. XIII. 219. 2.;
Gen. Crust. et Insect. IV. 24.; *Règne*
Anim. III. 475.; *Nouv. Edit.* V.
296.; *Nouv. Dict. d'Hist. Nat.* XVII.
514.; *Klug. Act. Nat. Cur. Berl.*
VI. 66. 2.

Leucopsis gigas. . . *Lam. Anim. sans Vertèbres*. IV. 151.;
Dumeril Dict. des Sci. Nat. XXVI.
 169.

Mas.—Nigra, flavo pubescens: caput inter oculos flavo bimaculatum: labium rufescens: oculi fusci: ocelli sordidè albidi: antennæ apice rufæ; articulus 1^{us}. flavus, extûs et apice supra niger: prothoracis scutellum flavo marginatum; mesothoracis scuti dorsum flavo bimaculatum, latera flavo vittata; super scutelli dorsum macula flava, anticè valdè emarginata; epimera ferè tota flava: metathoracis scutellum apice acutè bispinosum: abdomen flavo bifasciatum et apice maculatum: pedes flavi; pro- et mesocoxæ nigræ; metacoxæ nigræ, flavo supra basi et subtus apice maculatæ; trochanteres fusci; pro- et mesofemora basi nigrofusca aut nigra; metafemora nigra, extûs flava nigro maculata; dentes nigri; 1^{us}. brevis; 2^{us}. et 3^{us}. elongati, acuminati; cæteri obtusi, longitudine decrescentes; metatibiæ subtus nigrofuscae; tarsi fulvi: alæ iridescentes, fuscae; costa saturatior.

Fem.—Abdomen supra flavo 4-fasciatum, subtus rufofuscum, nitidum; fasciæ dissimiles, interruptæ: abdominis segmenti 1^{mi}. oviductus medium attingens, fuscus; tegmina nigra. (Corp. long. 4½—6 lin.; alar. 9—12 lin.)

July; South of France. M. F. de Laporte has taken it near Paris.

Sp. 3. *Leuc. nigricornis*.^c *Fem. Nigra, flavo-variegata, prothoracis scutello flavo-bifasciato, mesoscuti dorso immaculato, oviductu abdominis basim non attingente.*

Leucopsis dispar. a. Fonscol. Ann. Sci. Nat. 26. 275.

Nigra, flavo pubescens: caput immaculatum: labium rufescens: oculi fusci: ocelli sordidè albidi: antennæ apice fuscae: prothoracis scutellum flavo bifasciatum; fascia antica medio angustior: mesothoracis scuti latera flavo vittata; epimera flavo maculata; metathoracis scutellum inerme?; super dorsum macula flava, anticè valdè emarginata: abdomen utrinque supra flavo 4-maculatum, subtus rufo-fuscum; maculae dissimiles: abdominis segmenti 1^{mi}. oviductus apicem attingens, fuscus; tegmina nigra: pedes flavi; coxæ nigræ; metacoxæ supra basi et subtus apice flavo maculatæ; trochanteres nigrofusci; pro- et mesofemora basi nigra; metafemora nigra, externè flava nigro maculata; dentes nigri, 1^{us}. brevis, 2^{us}. et 3^{us}. elongati, acumi-

^c This, and many of the following species, were sent to me by M. F. de Laporte, with the MS. names which I have adopted.

nati; cæteri obtusi, longitudine decrescentes; metatibiæ subtus nigro-fuscæ; tarsi fulvi: alæ iridescentes, fuscæ; costa saturator. (Corp. long. 6 lin.; alar. 12 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 4. Leuc. intermedia. Fem. *Nigra, flavo variegata, prothoracis scutello flavo-marginato, mesoscuti dorso unimaculato, oviductu abdominis basim superante.*

Leucospis dorsigera . *Rossi Mant.* 134. 297. *De Villers Ent.* III. Pl. 8, fig. 17. *Panz. Faun. Ins. Germ.* 15. Tab. 17.

Leucospis intermedia . *Illiger. Edit. Faun. Etrusc.* II. 130. *Klug Act. Nat. Cur. Berl.* 67. 4.

Nigra, flavo pubescens: caput inter oculos flavo bimaculatum: labium rufescens: oculi fusci: ocelli sordidè albidi: antennæ nigræ; articulus 1^{us}. flavus, extûs et apice supra niger: prothoracis scutellum flavo marginatum: mesothoracis scuti dorsum flavo unimaculatum, latera flavo vittata; super scutelli dorsum macula flava, anticè valdè emarginata; epimera flavo maculata: metathoracis scutellum apice acutè bispinosum: abdomen flavo 4-fasciatum, subtus rufo-fuscum; fasciæ dissimiles, basalis et apicalis interruptæ: oviductus mesothoracis ad scutelli medium productus, fuscus; tegmina nigra: pedes flavi; coxæ nigræ; metacoxæ supra basi flavo maculatæ; trochanteres fusci; pro- et mesofemora basi nigra; metafemora nigra, extûs flava, nigro maculata; metatibiæ subtus nigro-fuscæ; tarsi fulvi: alæ iridescentes, fuscæ; costa saturator. (Corp. long. 5 lin.; alar. 9 lin.)

July; South of France.

Sp. 5. Leuc. varia. Fem. *Nigra, flavo variegata, prothoracis scutello flavo bifasciato, mesoscuti dorso bimaculato, oviductu abdominis basim non attigente.*

Leucopsis intermedia . *Lamarck. Anim. sans Vertèbres.* IV. 152.

Leucopsis varia . . *Klug Act. Nat. Cur. Berl.* VI. 67. 3.

Nigra, flavo pubescens: caput inter oculos flavo bimaculatum: labium rufescens: oculi fusci: ocelli sordidè albidi: antennæ
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apice rufo-fuscae; articulus 1^{us}. fulvus, apice fuscus; 2^{us}. nigro-fuscus; 3^{us}. et 4^{us}. rufi: prothoracis scutellum flavo bifasciatum; fascia antica medio angustior, posticè incisa: mesothoracis scuti latera flavo vittata, dorsum flavo bimaculatum; super scutelli dorsum macula flava, anticè valde emarginata; epimera ferè tota flava: metathoracis scutellum apice acutè bispinosum: abdomen supra flavo 4-fasciatum, subtus fuscum; fasciæ dissimiles, interruptæ: abdominis segmenti 1^{mi}. oviductus ferè basim attingens, fuscus; tegmina nigra: pedes fulvi; coxæ nigrae; metacoxæ supra basi et subtus apice flavo maculatæ; trochanteres nigri; pro- et mesofemora basi fusca; metafemora utrinque nigro maculata; dentes nigri; 1^{us}. brevis; 2^{us}. et 3^{us}. elongati, acuminati; sequentes obtusi, longitudine decrescentes: alæ iridescentes, fuscae; costa saturator. (Corp. long. 4—4½ lin.; alar. 9—9½ lin.)

July; South of France.

Sp. 6. Leuc. aculeata.

Leucospis aculeata . *Klug. Act. Nat. Cur. Berl.* VI. 68. 5.

DIVISIO II. *Metafemora subtus dentibus 10 armata.*

Sp. 7. Leuc. Biguetina. Mas et Fem. *Nigra, flavo variegata, prothoracis scutello flavo bifasciato, fascia postica abbreviata.*

Leucospis gibba . . *Klug. Act. Nat. Cur. Berl.* VI. 70. 8.

Leucospis Biguetina *Jurine, Nouv. Method. Hyménopt. &c.* 307. Pl. 13. 45.

Mas. Nigra, pubescens: caput immaculatum: labium rufescens: oculi fusi: ocelli sordidè albi: antennæ omnino nigrae: prothoracis scutellum flavo bifasciatum; fascia antica medio angustior, postica abbreviata: mesothoracis scuti latera flavo vittata; super scutelli dorsum fascia flava, anticè valde emarginata; epimera ferè tota flava: metathoracis scutellum apice acutè bispinosum: abdomen gibbum, supra flavo trifasciatum: pedes flavi; coxæ nigrae; trochanteres fusi; pro- et mesofemora basi fusca; metafemora nigra, apice supra flava, subtus dentibus 10 nigris armata, dens basalis magnus, cæteri minimi; metatibiæ subtus pallidè fuscae; tarsi fulvi: alæ iridescentes, subfuscae; costa et apex saturatiores.

Fem. Abdomen flavo 4-fasciatum; fasciæ 3^a. et 4^a. interruptæ, hæc quoque abbreviata: oviductus abdominis medium attingens. (Corp. long. $3\frac{1}{2}$ lin.; alar. $6\frac{1}{2}$ lin.)

Var. β.—Fem. Mesothoracis scuti dorsum flavo bimaculatum.

Described from specimens taken near Paris by M. F. de Laporte.

DIVISIO III. *Metafemora subtus dentibus 15 armata.*

Sp. 8. Leuc. dorsigera. Mas et Fem. *Nigra, flavo variegata, prothoracis scutello flavo bifasciato, fascia antica abbreviata.*

Leucospis cœlogaster . *Schränk Schriften Berl. Gesellschaft. I. 301. Tab. 8. fig. 4—6. Faun Boica II. 2. 221. 1980. Gmel. 2741. 2. Oliv. Encycl. Hist. Nat. Ins. Tom. VII. 532. 3. Hochenwarth. Schriften Berl. Ges. VI. 344. Tab. 8. fig. 34.*

Leucospis dubia . . *Schränk. Fauna Boica. II. 2. 222. 1981.*

Leucospis dorsigera . *Fabr. Ent. Syst. 2. 246. 2.; Syst. Piez. 168. 2. Latr. Hist. Nat. des Ins. XIII. 281. 1. Gen. Crust. et Insect. IV. 24. Règne Anim. III. 475; Nouv. Edit. V. 296. Nouv. Dict. d'Hist. Nat. XVII. 513. Pl. G. 3. 7. Panz. Faun. Ins. Germ. 58. 15. Illig. Edit. Faun. Etrusc. II. 130. et 280. 856. β. Spin. Ins. Lig. Fasc. I. 63. De Vill. Ent. III. 260. 1. Tab. 8, fig. 17. Klug Act. Nat. Cur. Berl. 69. 6.*

Leucospis dispar . . *Fabr. Syst. Piez. 169. 6.*

Leucospis intermedia *Spin. Ins. Lig. Fascic 4. 236. Fonscol. Ann. Sci. Nat. 26. 274.*

Leucopsis dorsigera . *Lam. Anim. sans Vertèbres. IV. 151. Dumeril. Dict. des Sci. Nat. 26. 169. Pl. 34, fig. 2.*

Mas. Nigra, pubescens: labium rufescens: oculi fusci: ocelli sordide albid: antennæ nigræ; articulus 1^{us}. flavus, apice et supra fuscus:

prothoracis scutellum flavo bifasciatum; fascia antica abbreviata; postica per scutelli latera producta: mesothoracis scutum immaculatum; super scutelli dorsum fascia flava integra aut paullò emarginata; epimera flavo maculata: metathoracis scutellum inerme: abdomen supra flavo 4-fasciatum; fasciæ 1^{ma}. et 4^{ta}. abbreviatæ: pedes flavi; coxæ nigræ; metacoxæ subtus apice flavo maculatæ; trochanteres nigro-fusci; pro- et mesofemora basi fusca; metafemora nigra, subtus versus basin et supra flava; dentes nigri, basalis magnus, cæteri minimi; metatibiæ subtus nigræ; tarsi fulvi: alæ iridescentes, subfuscae; costa et apex saturatiores.

Fem. Scapi omninò flavi: abdomen supra flavo trifasciatum, subtus rufo-fuscum; fasciæ interruptæ, inter 1^{am}. et 2^{am}. maculæ duæ laterales flavæ: oviductus abdominis basim attingens: profemora nigro-fusca, apice flava; intermedia pallidiora: protibiæ extùs fusco vittatæ. (Corp. long. 2½—4 lin.; alar. 4—6 lin.)

Var. β.—Mas. Antennæ omninò nigræ: prothoracis fascia postica non per scutelli latera producta: metacoxæ nigræ, apice subtus fusco maculatæ; pro- et mesofemora nigro-fusca, apice flava; metafemora nigra, basi subtus et supra apice flavo maculata; pro- et mesotibiæ extùs fusco vittatæ; metatibiæ subtus et intùs nigræ.—Species distincta?

Var. γ.—Fem. Abdominis fascia apicalis angusta, abbreviata: metafemora nigra, supra apice flava.

Described from specimens taken near Paris, by M. F. de Laporte.

Sp. 9. Leuc. bifasciata.

Leucospis, &c. . . *Fuessly Archiv.* III. Tab. 18. fig. 11.

Leucospis bifasciata . *Klug. Act. Nat. Cur. Berl.* 70. 7.

Family CHALCIDIDÆ.

Structura varia: reliquis hujus ordinis characteres sequentes immutati eam distinguunt; oviductus infra abdomen occultus; metapedes femoribus et coxis maximis, tibiis arcuatis; proalæ ultra medium nervus ordinarius ramulum emittens brevissimum, nonnunquam furcatum: ocelli 3, supra verticem trigonè dispositi: pro- et mesocoxæ trigonæ, mediocres: tarsi plerumque graciles; articulus 1^{us}. elongatus; sequentes longitudine decrescentes; ultimus 2^o longior.

Characteres Generum.

Caput	inerm. Petiolus	{	elongatus.	{	medio frontis insertæ	I. SMIERA.			
			Antennæ		prope os insertæ		II. EPITRANUS.		
	{	brevissimus.	{	medio frontis insertæ	III. CHALCIS.				
				Antennæ		prope os insertæ.	{	acuminatæ	IV. HALTICELLA.
		Metatibiæ	non acuminatæ.		{	graciles .		V. HOCKERIA.	
		apice				Metatarsi			
		armatum					VII. DIRHINUS.		

GENUS I.—SMIERA, *Spinola*.

Sphex. *Linnaeus, Fabricius, Villers, Sulzer, Schrank, Christ.*

Chrysis. *Fabricius.*

Vespa. *Geoffroy, Fourcroy.*

Chalcis. *Fabricius, Gmelin, Panzer, Hubner, Rossi, Latreille, Stewart, Olivier, Spinola, Donovan, Lamarck, Leach, Samouelle, Dalman, Fonscolombe, Cuvier, Jurine, Illiger, Walckenaer, Dumeril.*

Smiera. *Spinola, Curtis.*

Corpus punctatum, pubescens: caput mediocre, transversum, thorace vix angustius, anticè ubi scapi insident excavatum: antennæ 13-articulatæ, medio frontis insertæ, *maris* fusiformes aut filiformes, *fem.* clavatæ; articulus 1^{us}. elongatus, in-canaliculo frontali receptus; 2^{us}. minutus; 3^{us}. minimus, vix conspicuus; 4^{us}. elongatus; 5^{us}. et 5 sequentes longitudine decrescentes; clava triarticulata, ovata: labrum breve, transversum, apice ciliatum: mandibulæ parvæ; una ferè recta, subquadrata, tridentata; altera arcuata, bidentata; dentes obtusi: maxillæ elongatæ, apicem versus internè in lobum productæ latum ciliatum apice incisum; palpi 4-articulati, filiformes; articuli 1^{us}. et 3^{us}. breviores; 2^{us}. et 4^{us}. longiores: mentum elongatum, angustum; palpi 3-articulati, subfiliformes, articulus 3^{us}. acuminatus, setosus: labium angustum, fissum: thorax ovatus: prothoracis scutellum minimum, posticè incurvum; pectus parvum: mesothoracis scutum maximum; parapsides optimè determinatæ; scutellum maximum, semicirculus; paraptera et epimera trigona, maxima; sternum parvum: metathoracis scutellum parvum;

postscutellum maximum; paraptera et epimera trigona; sternum parvum: petiolus elongatus, linearis, abdomine brevior: abdomen glabrum, gibbum, compressum, coarctatum, nonnunquam apice elongatum et acuminatum; segmentum 1^{um}.^d maximum; cætera breviora; segmenta ventralia pauca *maris* abdominis apicem versus conspicua: *fem.* lamina angusta segmenta omnia ventralia et oviductum nisi ad apicem abscondit: propedes breves; trochanteres parvi; femora subclavata; tibiæ apice spina elongata valida armata; ungues elongati, subarcuati: pulvilli minuti: mesopedes longiores et graciliores, cætera propedum: metapedum coxæ maximæ, elongatæ; femora maxima, ovata, subtus dentibus plurimus armata, quorum basalis maxima; tibiæ valdè arcuatæ, subtus canaliculatæ, femoribus appressæ; apicis angulus internus productus, acuminatus; cætera propedum: proalæ nervus ordinarius ante medium costæ junctus, inde per costam ferè ad alæ apicem productus: nervi duo longitudinales sinuati, indistincti, anticus furcam emittens ramulo stigmatali junctam: metalæ angustæ; nervus ordinarius ultra medium productus, apice hamo armatus.

Divisio 1. *Abdomen breve, vix longius quàm latum.*

Latreille supposed that these insects infest the *Stratiomydæ*, or other *Diptera*, that are aquatic in their larva state. *C. xanthostigma*, Dalm. - is parasitic upon a species of *Hylotoma*.

Sp. 1. *Smi. nigrifex*. Mas et Fem. *Nigra, petiolo et pedibus flavis, his nigro variegatis.*

Sphex nigrifex. . . *Sulzer, Hist. Ins.* 191. 1. fig. 27. 1.

Vespa &c. . . . *Geoffroy, Ins. Par.* II. 380. 16.

Vespa dearticulata. *Fourc. Ent. Par.* Tom. II. 437. 16.

Sphex sispes . . . *Fabr. Sp. Ins.* I. 446. 61. *Villers, Ent.* Tom. I. 222. 6.

Chrysis sispes . . . *Fabr. Syst. Ent.* 359. 15.

Chalcis sispes . . . *Fabr. Mant. Ins.* I. 272. 1. *Ent. Syst.* II. 194. 1. *Syst. Piezat.* 159. 1. *Gmel. Syst. Nat.* I. 5. 2742. 1. *Hubn. Naturf.* 24. 54. 18. Tab. 2.

^d The second segment of my preceding descriptions; the petiole being considered as the first. The other alterations require no explanation.

fig. 22. *Panz.* 77. 11. *Stew.* II. 236. *Rossi, Faun. Etrusc.* II. 58. 802. *Oliv. Encycl. Méthod.* V. 438. 2. *Spin. Ins. Lig.* fasc. 1. 62. *Latr. Règne Anim.* III. 474; *Nouv. Edit.* V. 295. *Nouv. Dict. d'Hist. Nat.* VI. 23. 10. *Lam. Anim. sans Vertèbres,* IV. 153. *Fonscol. Ann. Sci. Nat.* XXVI. 275. 1.

Smiera sispes . . . *Spinola. Ann. du Muséum d'Hist. Nat.* Tom. XVII.

Smiera petiolatus . *Curtis Brit. Ent.* 472.

Mas.—Nigra, pilis canis vestita: caput inter oculos flavo bimaculatum: oculi ocellique fusi: antennæ fusiformes, corporis dimidio longiores; scapus nitidus; clava articulis 2 præcedentibus paullo brevior: palpi maxillares articulis 4; 1^{us}. mediocris; 2^{us}. vix longior; 3^{us}. brevior; 4^{us}. elongatus, fusiformis, setosus: palpi labiales articulis 3; 1^{us}. et 2^{us}. breves; 3^{us}. longior: mesothoracis scutellum apice bisponosum; squamulæ flavæ: petiolus flavus: abdomen nitidum; segmenta 1^{um}. et 2^{um}. maxima; sequentia parva, subæqualia: pedes nigri; metacoxæ supra apice spinosæ; pro et mesofemora apice flava; metafemora flava, apice et supra basi nigra, subtus dentibus 13 nigris armata; pro et mesotibiæ fusæ, apice basique flavæ; metatibiæ apice flavæ; tarsi fulvi, apice fusi: alæ subfusæ; nervi fusi.

Fem.—Antennæ breviores, tenuiores, clavatæ: metafemorum dens basalís multò longior et crassior: petiolus brevior: abdominis segmenti 1ⁱ. latera latiora; 2^{um}. parvum, 1ⁱ. margine ferè occultum; 3^{um}. magnum, latera 1ⁱ. margine ferè occulta; sequentia minima: oviductus rufo-fuscus. (Corp. long. 3 lin. ; alar. 5 lin.)

Common in the South of Europe; rare in the North. July; South of France; on aquatic plants. M. F. de Laporte has taken it near Paris.

Sp. 2. *Smi. sispes.* Mas et. Fem. *Nigra, metafemoribus tarsisque rufis.*

Sphex sispes . . *Linn. Syst. Nat.* XII. 2. 943. 13. *Faun. Suec.* 1657.

Chalcis clavipes. *Fabr. Mant. Ins.* I. 272. 2. *Ent. Syst.* III. 2. 195. 2. *Syst. Piezat.* 159. 2. *Gmel. Syst. Nat.* 1. 5. 2742. 2. *Hubn.*

Naturf. 24. 56. 19. Tab. 2. fig. 23.
Oliv. Encycl. Méthod. V. 438. *Rossi Faun. Etrus.* II. 58. 803. *Latr. Règne Anim.* III. 474; *Nouv. Edit.* V. 295.
Nouv. Dict. d'Hist. Nat. VI. 13. Pl. B. 23. 10. *Panz.* 78. fig. 15. *Don.* XI. 57. 379. *Lam. Anim. sans Vertèbres,* IV. 153. *Leach, Ed. Encycl.* IX. 144. *Samouelle,* 271. Pl. 8. fig. 6. *Fonscol. Ann. Sci. Nat.* XXVI. 276. 2.

Smiera clavipes . *Spin. Ann. du Muséum, &c.* Tom. XVII.

Chalcis sispes . *Dalm. Act. Kongl. Vetensk. Acad. Handl. für år.* 1820.

Smiera sispes . . *Curtis, Brit. Ent.* 472.

Mas.—Nigra, pilis canis vestita: oculi ocellique fuscii: antennæ subfiliformes, corporis dimidio breviores; scapus nitidus: palpi maxillares articulis 4; 1^{us}. brevis, extûs excavatus; 2^{us}. multò longior; 3^{us}. brevis, 1^o. æqualis: mentum quàm *S. nigrifcis* latius: palpi articulis 3 ferè æqualibus; 2^{us}. paullò brevior: mesothoracis scutellum apice bisponosum; squamulæ fuscae: petiolus quàm *S. nigrifcis* brevior: abdomen nitidum: pedes nigri; pro- et mesofemora apice rufa; metafemora rufa, apice nigra, subtus dentibus 8 inæqualibus armata; pro- et mesotibiæ nigro-fuscae; metatibiæ nigrae; tarsi rufi, apice fuscii; alæ subfuscae, apice fuscae; nervi fuscii.

Fem.—Antennæ paullò breviores, clavatae: oviductus rufo-fuscus. (Corp. long. $2\frac{3}{4}$ — $3\frac{1}{4}$ lin.; alar. $4\frac{3}{4}$ — $5\frac{1}{4}$ lin.)

Var. β.—Metafemora extûs flavo maculata.

Described from specimens taken at Paris by M. F. de Laporte. Unlike *C. nigrifex*, it abounds more in the North than in the South of Europe.

There are three more described European species; viz.—

Sp. 3. *Smi. melanaris*.

Chalcis melanaris . . *Dalm. Act. Kongl. Vetensk. Acad. Handl. für år.* 1820.

Smiera Macleanii . . *Curtis, Brit. Ent.* 472.

Taken lately in Essex.

Sp. 4. Smi. biguttata.

Chalcis biguttata. . . *Spin. Ins. Lig.* Fasc. 4^{us}. 231.

Sp. 5. Smi. xanthostigma.

Chalcis xanthostigma. *Dalm. Act. Kongl. Vetensk. Acad. Handl. för år. 1820.*

DIVISIO II. *Abdomen apice elongatum et acuminatum.*

The exotic species of this division, and of some genera nearly allied to it, are very numerous.

Sp. 6. Smi. subpunctata. Mas et Fem. *Flava, nigro variegata, alis hyalinis.*

Mas.—Flava, vix pubescens: caput subtus nigro fasciatum: oculi virides: ocelli fusi: antennæ subfusiformes, fusæ, subtus fulvæ: mesothoracis scutum anticè nigrum, medio nigro vittatum; parapsides nigro maculatæ; paraptera nigro maculata, maculæ inter scutum et scutellum conjunctæ; super scutellum macula teliformis nigra; pectus nigro bimaculatum: metathoracis scutellum nigro fasciatum: petiolus abdominis dimidio brevior: abdomen elongato-ovatum, nitidum, fulvum; maculæ 5 dorsales et apex nigrae; segmentum 1^{um}. flavum, magnum; cætera parva; pedes flavi; metacoxæ extûs nigro maculatæ; metafemora subtus basi et apice nigro maculata, subtus dentibus 14 nigris armata; dens basalis magna, cæteri minimi; metatibiæ basi, apice et subtus fusæ; ungues et pulvilli fusi: alæ hyalinæ, iridescentes; nervi fulvi.

Fem.—Antennæ subclavatæ: abdomen apice acuminatum; segmentum 1^{um}. magnum; 2^{um}. et 4 sequentia minuta; cætera elongata: oviductus fuscus. (Corp. long. 2½ lin.; alar. 3 lin.)

Var. β—*Mas*, abdomen fulvum, fusco fasciatum.

Taken in St. Vincent's island, by the Rev. Lansdown Guilding: described also from a Cayenne specimen in the collection of M. F. de Laporte.

Sp. 7. Smi. fulvescens. Mas et Fem. *Lætè ferruginea, abdomine fusco, alis hyalinis.*

Mas.—Ferruginea, subtus pallidior, vix pubescens: oculi virides: ocelli fusci: antennæ subfusiformes, fuscæ, subtus fulvæ: petiolus gracilis, abdominis dimidio brevior: abdomen elongato-ovatum, nitidum, ferrugineum, supra fusco fasciatum: pedes flavescentes; metafemora subtus dentibus 14 nigris armata; dens basalis magna, cæteri minimi; metatibiæ subtus fuscæ; ungues et pulvilli fusci: alæ hyalinæ, iridescentes; nervi fulvi.

Fem.—Antennæ subclavatæ: petiolus quàm *maris* brevior: abdomen acuminatum; segmenta apicalia elongata; apex nigro-fusca: oviductus omninò occultus. (Corp. long. $2\frac{1}{2}$ lin.; alar. 3 lin.)

Var. β.—*Mas.*, abdomen fuscum, basi fulvo fasciatum.

Taken in St. Vincent's island, by the Rev. Lansdown Guilding.

GENUS II.—EPITRANUS,^c *Walker.*

Fem.—Corpus punctatum, sparsè pubescens: caput mediocre, transversum, ferè trigonum: antennæ 14-articulatæ, subfusiformes, corporis dimidio breviores, basi approximatae, prope os insertæ: articulus 1^{us}. valdè elongatus, flagelli dimidio longior; 2^{us}. brevis; 3^{us}. minimus; 4^{us}. et 11 sequentes subæquales; clava 3-articulata, conica, articulis 10^o. et 11^o. brevior et angustior: mandibulæ angustæ; una recta, bidentata, dentes acuti, externus magnus; altera apice arcuata, dente brevi acuto terminata: thorax ovatus: prothoracis scutellum mediocre, posticè incurvum; pectus parvum: mesothoracis scutum mediocre; parapsides optimè determinatæ, maximæ, convexæ; paraptera et epimera trigona, magna; scutellum maximum, ferè rotundum; sternum parvum: metathoracis scutellum et postscutellum parva; sternum magnum: petiolus linearis, abdominis dimidio longior: abdomen elongato-ovatum, vix compressum, subtus carinatum, apice acuminatum; segmentum 1^{um}. maximum, ferè ad apicem productum; cætera minima, brevissima: oviductus occultus: pro- et mesopodum coxæ parvæ; femora clavata; tibiæ apice spina elongata, valida, arcuata armatæ; ungues et pulvilli minuti: metapedum coxæ apice angustiores; femora subtus dentibus 9 armata; quorum basalis maximus, obtusus; cæteri minimi, acuti; tibiæ *Smieræ*: alæ breves; nervi indistincti.

Sp. 1. *Epi. fulvescens.* *Fem. Rufo-fuscus, tarsis flavis, alis albis.*

^c ἐπὶ ἀντὶ, τρανὴς planus.

Caput punctatum: oculi ocellique fuscī: antennæ fuscae; articulus 1^{us}. fulvus: thorax punctatus; squamulae flavae: petiolus striatus: abdomen nitidum, glabrum: metatibiae subtus fuscae; tarsi flavi; ungues et pulvilli fuscī: alae albæ, iridescentes; nervi flavi. (Corp. long. $1\frac{1}{2}$ —2 lin.; alar. 2— $2\frac{1}{2}$ lin.)

Taken in St. Vincent's Island, by the Rev. Lansdown Guilding.

GENUS III.—CHALCIS, *Fabricius*.

Vespa *Linnæus, Geoffroy, Fourcroy*.

Chalcis . . . *Fabricius, Gmelin, Rossi, Latreille, Panzer, Olivier, Lamarck, Cuvier, Spinola, Dumeril, Dalman, Leach*.

Brachymeria. *Westwood*.

Corpus punctatum, pubescens: caput mediocre, breve, transversum, thorace non latius, anticè ubi scapi insident excavatum: oculi mediocres: ocelli trigonè dispositi: antennæ 13-articulatæ, plus minusve fusiformes, medio frontis insertæ; articulus 1^{us}. elongatus; 2^{us}. mediocris; 3^{us}. minimus; 4^{us}. et 6 sequentes crassi, subæquales, longitudine decrescentes; clava 3-articulata, conica, articulis 2 præcedentibus brevior: mandibulae arcuatæ, bidentatæ; dentes obtusi, internus brevior: maxillæ elongatæ, angustæ, intus apicem versus in lobum tripartitum productæ: palpi 4-articulati, ferè filiformes; articuli 1^{us}. et 3^{us}. breves; 2^{us}. longior; 4^{us}. multò longior, fusiformis: mentum ovatum: palpi articulis 3; 1^{us}. et 3^{us}. apice crassiores; 2^{us}. brevis: labium angustum, fissum: thorax ovatus: prothoracis scutellum magnum, subquadratum, posticè excavatum, anticè angustius; pectus parvum: mesothoracis scutum maximum; parapsides benè determinatæ; scutellum maximum, latius quàm longum, apice plerumque bispinosum; paraptera et epimera magna, trigona; sternum parvum: metathorax parvus; scutellum mediocre: petiolus brevissimus: *maris* abdomen gibbum, vix duplo longius quàm latum; segmentum 1^{um}. maximum, dimidium occupans; 2^{um}. mediocre; sequentia minima; segmenta 7 aut plura ventralia subtus abdomen conspicua, quorum 1^{um}. et 2^{um}. magna, reliquæ minuta: *fem.* abdomen paullò longius et acutius, infra carinatum; segmenta ventralia vix conspicua: propedes mediocres; coxæ trigonæ; trochanteres parvi; femora paullò incrassata; tibiae subclavatæ, rectæ, apice spina magna arcuata armatæ; ungues et

pulvilli mediocres: mesopedes paullò longiores et tenuiores; spina tibialis brevior et gracilior; cætera propedum: metapedes et alæ *Smieræ*.

Sp. 1. Chal. femorata. Mas. *Nigra, pedibus flavis, meta-femoribus nigro fasciatis.*

Chalcis femorata . *Panz. Faun. Ins. Germ. Fasc. 84. fig. 16.*
Chalcis flavipes . *Latr. Gen. Crust. et Insect. IV. 26.*

Nigra, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ subfusiformes, nigræ, apice rufo-fuscae: mesothoracis scutellum apice acutè bispinosum; squamulæ flavæ: abdomen nitidum, punctatum: pedes flavi; coxæ nigræ; trochanteres fusci; pro- et mesofemora basi nigra; metafemora nigro cingulata, subtus dentibus 12 inæqualibus armata; pro- et mesotibiæ subtus fusco maculatæ; metatibiarum canaliculorum margines fusci; ungues et pulvilli fusci: alæ subhyalinæ; nervi fusci. (Corp. long. $2\frac{1}{2}$ —3 lin.; alar. $4\frac{1}{2}$ —5 lin.)

Taken near Paris, from the pupæ of *Zygæna Filipendulæ*, by M. F. de Laporte.

Sp. 2. Chal. flavipes. Fem. *Nigra, pedibus flavis, meta-femoribus basi nigris, alis subhyalinis.*

Chalcis flavipes . *Fabr. Ent. Syst. II. 197. 10. Syst. Piezat. 167. 32. Latr. Hist. Nat. des Ins. XIII. 220. Panz. Fasc. 78, fig. 16. Fonscol. Ann. Sci. Nat. XXVI. 276.*

Nigra, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ fusiformes, nigræ, apice rufo-fuscae: mesothoracis scutellum inerme; squamulæ flavæ: abdomen nitidum, ferè glabrum: pedes flavi; coxæ nigræ; trochanteres fusci; pro- et mesofemora basi nigra; metafemora nigra, apice flava, subtus dentibus 13 aut 14 inæqualibus armata; pro- et mesotibiæ subtus fusco maculatæ; metatibiæ subtus fuscae; ungues et pulvilli fusci: alæ subhyalinæ; nervi fusci. (Corp. long. 3 lin.; alar. 5 lin.)

Taken near Paris, by M. F. de Laporte. It may be the female of the preceding species.

Sp. 3. Chal. distinguenda. Mas et Fem. *Præcedenti, minor, nigra, pedibus flavis, metafemoribus basi nigris, alis hyalinis.*

Mas. Nigra, pilis canis vestita: oculi fuscii: ocelli rufo-fuscii: antennæ subfusiformes, nigrae, apice rufo-fuscae: mesothoracis scutellum dentibus 2 brevissimis obtusis armatum; squamulae flavae: abdomen nitidum, sparsè punctatum: pedes flavi; coxae nigrae; trochanteres fuscii; femora nigra, apice flava; metafemora subtus dentibus 12 armata; pro- et mesotibiæ subtus fusco maculatae; metatibiæ subtus fuscae; ungues et pulvilli fuscii: alae hyalinae; nervi fuscii.

Fem. Antennæ fusiformes, paullò breviores et crassiores: mesothoracis scutellum inerme. (Corp. long. 2—2½ lin.; alar. 4—4½ lin.)

Taken near Paris, by M. F. de Laporte. July; South of France.

Sp. 4. Chal. tibialis. Mas. *Nigra, pedibus flavis, pro- et mesotibiis nigro maculatis.*

Nigra, pilis canis vestita: oculi fuscii: ocelli rufo-fuscii: antennæ nigrae, apice rufo-fuscae: mesothoracis scutellum apice bispinosum; squamulae flavae: abdomen nitidum, sparsè punctatum et pubescens: pedes flavi; coxae nigrae; trochanteres fuscii; femora nigra, apice flava; metafemora subtus dentibus 12 armata; pro- et mesotibiæ extus et subtus nigro maculatae; metatibiæ subtus nigrae; ungues et pulvilli fuscii: alae hyalinae; nervi fuscii. (Corp. long. 2 lin.; alar. 4 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 5. Chal. annulipes. Mas et Fem. *Nigra, pedibus flavis, tibiis omnibus nigro maculatis.*

Chalcis flavipes . . *Fabr. Ent. Syst. II. 197. 10. Syst. Piezat. 167. 32.?*

Mas. Nigra, pilis canis vestita: oculi fuscii: ocelli rufo-fuscii: antennæ nigrae, apice rufo-fuscae: mesothoracis scutellum apice tubercu-

Vespa minuta . . . *Linn. Syst. Nat.* 952. 28.
 Vespa, &c. . . . *Geoffroy. Ins.* II. 380. 15.
 Vespa femoralis . . *Fourc. Ent. Par.* II. 437. 15.
 Chalcis minuta . . *Fabr. Mant. Ins.* I. 272. 3. *Ent.*
 Syst. II. 195. 4. *Syst. Piezat.* 165.
 23. *Gmel. Syst. Nat.* 1. 5. 2742.
 3. *Latr. Hist. Nat. des Ins.* XIII.
 220. *Règne Anim.* III. 474; *Nouv.*
 Edit. V. 296. *Nouv. Dict. d'Hist.*

Nat. VI. 13. *Rossi, Faun. Etrusc.*
 II. 58. 804. *Oliv. Encycl. Méthod.*
 V. 439. 5. *Panz. Fasc.* 32. Tab. 6.
Lam. Anim. sans Vertéb. IV. 153.
Dum. Dict. des Sci. Nat. VIII. 69.
 Pl. 34. fig. 1. *Leach, Edin. Encycl.*
 IX. 144. *Fonscol. Ann. Sci. Nat.*
 XXVI. 277.

Chalcis femorata . *Dalm. Kongl. Vetens. Acad. für ür*
 1820.

Brachymeria minuta. *Westw. Lond. & Edinb. Phil. Mag.*
Third Series. Vol. I. 127.

Mas. Nigra, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ nigræ, apice rufo-fuscae: mesothoracis scutellum apice bispinosum; squamulae flavæ: abdomen ferè glabrum, sparsè pubescens: pedes flavi; coxæ nigræ; trochanteres fusci; femora nigra, apice flava; metafemora subtus dentibus 12 armata; tibiae fusco cingulatæ; metatibiae subtus quoque fuscae, basi rufo-fuscae; tarsi pallidè rufi; ungues et pulvilli fusci: alae subfuscae; nervi fusci.

Fem. Antennæ paullo breviores et crassiores: scutellum inerme: abdomen longius. (Corp. long. 2—2½ lin.; alar. 4—4½ lin.)

Var. β.—Mas. Tibiæ nigro cingulatæ.

Taken near Paris, by M. F. de Laporte. July; South of France. September; Lizard Point, Cornwall.

Sp. 8. *Chal. podagrica.* *Fem. Nigra, pedibus rufis, flavo variegatis.*

Chalcis podagrica. *Fabr. Mant. Ins.* I. 272. 5. *Ent. Syst.*
 II. 196. 6. *Syst. Piezat.* 166. 24.
Gmel. Syst. Nat. 1. 5. 2743. 5. *Hubn.*
Naturf. 24. 57. 20. Tab. 2. fig. 24.
Oliv. Encycl. Méthod. V. 439. 7.
Fonscol. Ann. Sci. Nat. 26. 277.

Chalcis femorata. *Fem. Dalm. Kongl. Vetens. Acad. Handl.*
für ür 1820.

Nigra, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennæ nigræ, apice rufo-fuscae: mesothoracis scutellum apice tubercu-

latum; squamulae flavae: abdomen ferè glabrum, sparsè pubescens: pedes rufi; coxae nigrae; metacoxae apice rufae; femora apice supra flava: metafemora subtus dentibus 12 armata; tibiae basi et apice flavo maculatae; metatibiae subtus fuscae; ungues et pulvilli fusci: alae hyalinae; nervi fusci. (Corp. long. 2—2½ lin.; alar. 4—4½ lin.)

Var. β. Pro- et mesopedes ferè omninò rufi.

Taken by M. F. de Laporte, near Paris. July; South of France.

Sp. 9. Chal. vicina. Fem. *Nigra, pedibus nigris, femoribus apice tarsisque rufis.*

Nigra, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennae nigrae: mesothoracis scutellum inerme; squamulae flavae: abdomen ferè glabrum, sparsè pubescens: pedes nigri; trochanteres fusci; pro- et mesofemora apice rufo-flavescentia; metafemora apicem versus rufescentia, apice supra flavo notata, subtus dentibus 12 armata; pro- et mesotibiae nigro-fuscae, apice basi subtusque rufescentes; metatibiae nigrae, supra basim versus et apice flavo maculatae; tarsi pallidè rufi; ungues et pulvilli fusci: alae subfuscae; nervi fusci. (Corp. long. 1¾—2 lin.; alar. 3¾—4 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 10. Chal. parvula. Mas et Fem. *Nigra, pedibus nigris, femoribus apice tarsisque flavis.*

Chalcis minuta. *Dalm. Kongl. Vetens. Acad. Handl. für år 1820.*

Mas. *Nigra*, pilis canis vestita: oculi fusci: ocelli rufo-fusci: antennae nigrae, apice rufo-fuscae: mesothoracis scutellum apice bispinosum; squamulae flavae: abdomen ferè glabrum, sparsè pubescens: pedes nigri; trochanteres fusci; femora apice flava; mesofemora subtus dentibus 12 armata; pro- et mesotibiae nigro-fuscae, apice basi subtusque flavae; metatibiae extùs basi et apice flavescentes; tarsi flavi; ungues et pulvilli fusci: alae hyalinae; nervi fusci.

Fem. Antennae paulò breviores et crassiores: scutellum inerme; abdomen longius. (Corp. long. 1—1¾ lin.; alar. 2—3¼ lin.)

Taken near Paris, by M. F. de Laporte. July; South of France.

GENUS IV. HALTICELLA,^f *Spinola*.

Chalcis. . . *Fabricius, Gmelin, Rossi, Hubner, Olivier, Latreille, Spinola.*

Halticella. Spinola.

Caput mediocre, transversum, thorace vix angustius, anticè ubi insident scapi excavatum: antennæ 13-articulatæ, prope os insertæ; *maris* subfusiformes, *fem.* subclavatæ, paullò breviores; articulus 1^{us}. elongatus, 2^{us}. cyathiformis, 3^{us}. minimus, 4^{us}. et 6 sequentes subæquales, magni; clava triarticulata, conica, articulis 2 præcedentibus brevior: mandibulæ arcuatæ, apice bidentatæ; dentes vix acuti: maxillæ elongatæ, apice intùs in lobum quasi articulatum productæ; palpi 4-articulati, breves; articulus 1^{us}. medio-ocris; 2^{us}. crassior, cyathiformis; 3^{us}. parvus; 4^{us}. elongatus, fusiformis, setosus: mentum elongato-ovatum; palpi 3-articulati, menti apice insertæ, breves; articulus 2^{us}. minimus: labium rotundum, integrum, anticè ciliatum: thorax ovatus: pectus parvum: prothoracis scutellum mediocre, subquadratum, posticè incisum: mesothoracis scutum magnum; parapsidum suturæ distinctæ; scutellum magnum, subrotundum: metathoracis scutellum, paraptera et epimera magna; illum medio canaliculatum: petiolus brevissimus: *maris* abdomen ovatum, convexum; segmentum 1^{um}. maximum, abdominis dimidio vix brevius; 2^{um}. mediocre; sequentia parva; subtus abdomen segmenta 6 ventralia conspicua, quorum 1^{um}. et 2^{um}. magna, cætera parva: *fem.* abdomen elongato-ovatum, subtus carinatum; segmenta ventralia occulta: propedes mediocres; femora subincrassata; tibiæ apice spina elongata valida arcuata armatæ: mesopedes paullò tenuiores; spina tibialis multo brevior et gracilior: metapedes coxis femoribusque maximis; hæ subtus dentibus 12 minutis armata; tibiæ arcuatæ, subtus canaliculatæ, apice intùs productæ, acuminatæ et spina armatæ: alæ *Chalcidis*.

Sp. 1. Hal. pusilla. Mas et Fem. *Nigra, femoribus apice flavis, tarsis fulvis, alis subfuscis.*

Chalcis pusilla. . . *Fabr. Mant. Ins. I. 272. 5. Ent. Syst. II. 197. 8. Syst. Piezat. 167. 29. Gmel. Syst. Nat. I. 5. 2743. 6. Hübner. Naturf. 24. 57. 21. Tab. 2. fig. 25. Ross. Faun. Etrusc. II. 59. 807. Oliv. Encycl. Méthod. V. 439. 8.*

Halticella pusilla. Spin. Ann. Mus. Hist. Nat. Tom. XVII.

^f ἄλτικος saltator, κέλλω celeriter moveo. It is usually spelt *Haltichella*.

Nigra, punctata, pilis canis vestita: oculi fuscii: ocelli rufo-fuscii: mesothoracis scutellum inerme; squamulae flavae: abdomen nitidum, glabrum, basi nudum: pedes nigri; pro- et mesofemora apice fulva; metafemora apice flava; pro- et mesotibiae fuscae, basi, apice et subtus fulvae; metatibiae apice et macula basim versus fulvae; tarsi fulvi; ungues et pulvilli fuscii: alae subfuscae, medio obscuriores: nervi fuscii. (Corp. long. $1\frac{1}{4}$ — $1\frac{3}{4}$ lin.; alar. $2\frac{1}{4}$ — $2\frac{3}{4}$ lin.)

Taken near Paris by M. F. de Laporte.

GENUS V. HOCKERIA,^g *De Laporte.*

Chalcis . . *Fabricius, Gmelin, Olivier, Latreille.*

Halticella. *Spinola, Olivier, &c.*

Hockeria. *De Laporte.*

Caput *Halticellae*: antennae 13-articulatae, prope os insertae; *maris* subfusiformes, corporis dimidio longiores; *fem.* subclavatae, paullo breviores; articulus 1^{us}. flagelli dimidii longitudinem; 2^{us}. cyathiformis; 3^{us}. et 8-sequentes subaequales; 12^{us}. et 13^{us}. minimi, vix conspicui: os *Halticellae*: thorax ovatus: pectus parvum: prothoracis scutellum magnum, quadratum: mesothoracis scutum magnum; parapsides bene determinatae; scutellum magnum, subrotundum; paraptera et epimera mediocria: metathoracis scutellum maximum, medio canaliculatum: *maris* abdomen sessile, ovatum, convexum; segmentum 1^{um}. magnum; sequentia parva, apicem versus longitudine decrescentia; subtus abdomen segmenta 7 ventralia conspicua, basalia apicalibus longiora: *fem.* abdomen elongato-ovatum, subtus carinatum; segmentum 1^{um}. maximum, abdominis dimidio paullo brevius; 2^{um}. mediocre; 3^{um}. 4^{um}. et 5^{um}. parva; 6^{um}. latius; segmenta ventralia vix conspicua: propedes mediocres; tibiae apice spina armatae; tarsi breves; ungues et pulvilli minuti: mesopedes paullo tenuiores: metapedes elongati; coxae maximae, trigonae; femora magna, ovata, subtus apice dentibus 2 magnis obtusis armata; tibiae arcuatae, subtus canaliculatae, apice latiores et spinis 2 armatae: proalae nervus ordinarius costae partem brevissimam occupans; ramulus stigmatalis minimus, vix furcatus.

This genus forms the second division of *Chalcis*, in Latreille's *Gen. Crust. et Ins. &c.* Spinola placed it with *Chalcis pusilla* in his genus *Halticella*, which was probably formed on the species belonging to it; but this being uncertain, I have

^g ὀγκρὸς tumidus.

adopted De Laporte's generic name. The peculiar form and low insertion of the antennæ, and the very short part of the costa occupied by the ordinary nervures of the superior wings, are characters possessed also by the *Encyrtidæ*.

Sp. 1. Hoc. bispinosa. Fem. *Nigra, pro- et mesotibiis tarsisque omnibus rufis, proalis medio fuscis, albo maculatis.*

Chalcis bispinosa. . *Fabr. Syst. Piezat.* 166. 28. *Fonscol. Ann. Sci. Nat.* 26. 279. 9.

Halticella bispinosa. *Spin. Ann. Mus. Hist. Nat.* Tom. XVII. *Oliv. Nouv. Dict. d'Hist. Nat.*

Nigra, nitida, punctata, vix pilosa: oculi fuscii: ocelli rufo-fuscii: mesothoracis scutellum apice bispinosum; squamulæ rufo-fuscæ: abdomen nitidissimum, glabrum, acuminatum, subtus rufo-fuscum; pedes nigri; pro- et mesotibiæ omnino, et metatibiæ apice rufæ: tarsi rufi; ungues et pulvilli fuscii: alæ subfuscæ; proalæ medio fuscæ, albo bimaculatæ; nervi fuscii. (Corp. long. 2 lin.; alar. $2\frac{3}{4}$ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 2. Hoc. bifasciata. Fem. *Nigra, tarsis rufis, proalis fusco bifasciatis.*

Chalcis bimaculata. *Fonscol. Ann. Sci. Nat.* XXVI. 280. 11.

*Nigra, obscura, punctata, pilosa: oculi fuscii: ocelli rufo-fuscii: antennæ nigrae, graciles, thorace longiores: mesothoracis scutellum inerme; squamulæ nigrae: abdomen *H. bispinosæ* sed brevius, nitidum, glabrum, basi nudum, subtus rufo-fuscum: pedes nigri; femora postica subtus fusca; coxæ, tibiæ apice tarsique rufescentes; ungues et pulvilli fuscii: alæ subfuscæ; proalarum fasciæ medio connectæ: nervi fuscii. (Corp. long. 1—1½ lin.; alar. 2—2½ lin.)*

Taken near Paris, by M. F. de Laporte.

Sp. 3. Hoc. hetera. Mas. *Nigra, pedibus rufis, metamor- femoribus et tibiis nigris, mesothoracis scutello integro.*

Nigra, nitida, punctata, pilosa: oculi fuscii: ocelli rufo-fuscii: antennæ nigrae, gracillimæ, corporis dimidio longiores; scapus perlongus: mesothoracis scutellum inerme; squamulæ rufo-

fuscæ: metathoracis scutellum maximum, apice utrinque productum: abdomen nitidum, glabrum, subtus apice rufo-fuscum: pedes rufi; coxæ nigrae; trochanteres fusi; pro- et mesofemora basi nigra; metafemora nigra, apice supra rufa; metatibiæ nigrae, apice rufæ; tarsi et ungues fusi: alæ subfuscæ; proalæ medio obscuriores; nervi fusi. (Corp. long. $1\frac{1}{4}$ lin.; alar. $2\frac{1}{4}$ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 4. Hoc. nigra. Mas. *Nigra, metafemoribus tarsisque omnibus rufis.*

Chalcis Dargelasii? *Latr. Hist. Nat. des Crust. &c. XIII. 221.*

Nigra, obscura, punctata, pilosa: oculi fusi: ocelli rufo-fusi: mandibulæ rufæ: antennæ nigrae, thoraci breviores: mesothoracis scutellum inerme; squamulæ nigro-fuscæ: metathoracis scutellum maximum: abdomen nitidum, glabrum: pedes nigri; metafemora rufa, basi extus, nonnunquam quoque supra et subtus nigra; tarsi rufi; ungues et pulvilli fusi: alæ hyalinæ; nervi pallidè fusi. (Corp. long. $1\frac{3}{4}$ —2 lin.; alar. $2\frac{1}{2}$ — $2\frac{3}{4}$ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 5. Hoc. nigripes. Mas. *Nigra, tarsis rufis, mesothoracis scutello integro.*

Chalcis nigripes. *Fonscol. Ann. Sci. Nat. XXVI. 280. 10.*

Nigra, obscura, punctata, pubescens: oculi fusi: ocelli rufo-fusi: antennæ nigrae: mesothoracis scutellum convexum, integrum; squamulæ nigrae: metathoracis scutellum maximum, striatum: abdomen nitidum, glabrum, basi nudum: pedes nigri; metacoxæ nitidissimæ; trochanteres, ungues et pulvilli fusi: tibiæ apice rufæ: tarsi rufi: alæ subhyalinæ; nervi fusi, basi pallidiores. (Corp. long. $1\frac{1}{2}$ lin.; alar. $2\frac{1}{4}$ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 6. Hoc. rufipes. Mas. *Nigra, pedibus rufis, metafemoribus et tibiis nigris, mesothoracis scutello bispinoso.*

Chalcis rufipes . *Oliv. Encycl. Méthod. V. 440. 11.*

Chalcis clavipes? *Rossi.*

Chalcis armata . *Dalm. Kongl. Vetens. Acad. Handl. für är. 1820. Var.?*

Cynips armata. . *Panz. Faun. Insect. Germ. 74. 9. Var.?*

Nigra, obscura, punctata, pilosa: oculi fusi: ocelli rufo-fusi: antennæ nigrae, graciles, corporis dimidio longiores: mesothoracis scutellum elevatum, apice spinis duabus longis obtusis armatum; squamulae nigro-fuscae: abdomen nitidum, glabrum, ferè nudum: pedes rufi; coxae nigrae; trochanteres fusi; pro- et mesofemora fusco cingulata; metafemora nigra; metatibiae nigrae, apice rufae; tarsi et ungues fusi: alae subfuscae; proalae medio obscuriores, macula prope stigma hyalina: nervi fusi. (Corp. long. 1—2 lin.; alar. 2—2½ lin.)

Var. β. Pro- et mesotibiae fusco cingulatae.

Taken near Paris, by M. F. de Laporte; also in England, by Mr. Curtis. Var. β is described from an English specimen.

Sp. 7. Hoc. unicolor. Mas. *Nigra, pedibus omnino nigris, alis hyalinis.*

Nigra, obscura, punctata, pilosa: oculi fusi: ocelli rufo-fusi: antennæ nigrae, corporis dimidii longitudinem: mesothoracis scutellum elevatum, apice spinis duabus brevissimis armatum; squamulae nigrae: abdomen nitidum, glabrum, ferè nudum: pedes nigri: alae hyalinae; nervi fusi. (Corp. long. 1 lin.; alar. 1½ lin.)

July; South of France.

GENUS VI. NOTASPIS,^h Walker.

Mas.—Caput magnum, transversum, thorace latius, anticè ubi insident scapi excavatum: oculi magni, prominentes, globosi: antennæ 13-articulatae, subclavatae, apice acuminatae, prope os insertae, corporis dimidio breviores; articulus 1^{us}. antennae triente longior; 2^{us}. mediocris; 3^{us}. minimus; 4^{us}. et 6 sequentes mediocres, subaequales; clava conica, articulis 9^o. et 10^o. longior: thorax ovatus: pectus parvum: prothoracis scutellum mediocre, subquadratum: mesothoracis scutum mediocre; parapsides benè determinatae, magnae, convexae; squamulae maximae, globosae; paraptera magna; scutellum maximum, metathoracem abdominisque basim transiens, apice acuminatum: metathorax parvus: abdomen sessile, ovatum, convexum; segmentum 1^{um}. maximum; caetera minima: pro- et mesopedes mediocres, femora subclavata, tarsi graciles; metapedes magni, coxae trigonae, femora ovata, tibiae subtus canaliculatae, tarsi crassi brevesque: alae *Hockeriae*.

^h νῶτος dorsum, ἀντίς clypeus.

Sp. 1. Not. formiciformis. Mas. *Æneus, antennis fuscis, tarsis fulvis, alis albis.*

Ænea, obscura, punctata, haud pubescens: oculi fusci: ocelli rufo-fusci: antennæ fuscae; articulus 1^{us}. æneus: thorax punctis magnis profundèque excavatis scaber; latera ferè glabra; squamulae rufo-fuscae, nitidae; mesothoracis scutellum elevatum, subtus apicem unidentatum: abdomen nitidum, glabrum: pedes nigro-ænei; trochanteres fusci; tibiæ apice fulvae; tarsi fulvi; ungues et pulvilli fusci: alæ albi, iridescentes; nervi pallidi, vix conspicui. (Corp. long. $\frac{2}{3}$ lin.; alar. $1\frac{1}{4}$ lin.)

Taken in St. Vincent's island, by the Rev. Lansdown Guilding.

GENUS VII. DIRHINUS, *Dalman.*

Chalcis. *Jurine, Latreille, Spinola.*

Mas.—Caput magnum, thorace non angustius, multò longius quàm latum, anticè inter oculos tuberculis duobus armatum, posticè sub prothorace productum; tubercula lata, obtusa, apice serrata: oculi mediocres, globosi: antennæ 13-articulatae, subclavatae, per longum striatae; articulus 1^{us}. elongatus; sequentes mediocres; ultimus minimus, vix conspicuus: mandibulae arcuatae; una bidentata; altera tridentata: thorax elongato-ovatus: pectus parvum: prothoracis scutellum magnum, subquadratum: mesothoracis scutum angustum; parapsides benè determinatae; scutellum mediocre: metathorax magnus: abdomen ovatum, petiolatum, supra planum, subtus carinatum, apice retusum: segmenta dorsalia subtus abdomen marginem formantia; 1^{um}. s. petiolus crassum; 2^{um}. maximum; cætera minima: segmenta nonnulla ventralia conspicua: tibiæ apice spina armatae: pro- et mesofemora clavata: metapedes magni; coxæ elongatae; femora ovata, subtus serrata; tibiæ arcuatae, subtus canaliculatae; tarsi graciles: proalæ angustae; nervus ordinarius costam longum occupans; ramulus stigmatalis vix ullus.

This genus is allied to *Cerocephala*, *Spalangia*, &c.

Sp. 1. Dir. cornigerus. Mas. *Ater, genubus tarsisque rufis, alis hyalinis.*

Chalcis cornigera. *Jur. Nouv. Méthod. Hyménopt.* 315. Pl. 13. 47. *Spin. Ins. Lig. Fascic.* 3^{us}. 164. 8.

Nigra, obscura, punctata, pubescens: oculi fusci: ocelli rufo-fusci: antennæ nigræ: caput scabrum: thorax lævior: squamulæ rufo-fuscae: metathorax carinatus, utrinque spinosus: abdomen nitidum, glabrum, basi striatum: pedes nigri; trochanteres fusci; pro- et mesofemora apice rufa; metafemora basi unidentata; pro- et mesotibiæ basi apiceque rufæ; tarsi rufi; ungues et pulvilli fusci: alæ hyalinæ; proalæ ad costam fuscae; nervi fusci. (Corp. long. 2 lin.; alar. $2\frac{1}{4}$ lin.)

Taken near Paris, by M. F. de Laporte.

ART. III.—*Capture of Insects at Burghfield*.—By the Rev.
C. S. BIRD, M.A. F.L.S.

Burghfield Hill House, near Reading, Aug. 1833.

SIR,—Having resided at this place about ten years, and employed my leisure hours in making an Entomological Collection, I think I have ascertained pretty nearly what this locality affords, amongst the more conspicuous insects at least; and, with your permission, I shall be happy to register, in your Magazine, the result of my researches. The country around me is woody, particularly abounding in elms, and my house is close to several copses, containing large, though not old, oaks, &c.; and at the distance of half a mile I have the range of a heathy common, terminating in fir-groves. There is no chalk, that I am aware of, within six miles.

I am particularly attached to *Lepidoptera*,—probably only because I have been most successful in this order. This success I owe to the use of a lamp to attract moths. During the moonless nights of summer, I sit with a Sinumbra-lamp, and perhaps one or two smaller lamps, placed on a table, close to the window. The moths speedily enter the room, if the weather be warm. I have had a levee of more than a hundred between the hours of ten and twelve. In the spring, too, and autumn, I have been frequently fortunate, though generally having my patience sufficiently tried. In March, for instance, I have taken many specimens of *Biston prodromarius* in one evening; *Glæa rubricosa*, and *Lytæa leucographa*, have accompanied them. In April and May, *Cucullia fissina*, and *Peridæa serrata*, have visited me. When November has arrived,

Petasia cassinea and *Pæcilocampa populi* have crowded into my room. Of course, at such cool times of the year the window must be kept shut, till the moths knock for admittance. If at any time of the year a warm mist pervade the air, there is almost a certainty of success. But should any one be induced by this account to try the lamp, he must make up his mind to experience more of unfavourable evenings than favourable. There is, however, this advantage in my sedentary plan of mothing, that it can be combined with reading or writing; and the intervals between the arrivals need not be lost.

Moths are extremely sensible of any keenness in the air; a north or east wind is very likely to keep them from venturing abroad. Different species have different hours of flight. Thus, on a mild and dark November evening, *Pæcilocampa populi* will occupy from seven to ten o'clock, after which it will make way for *Petasia cassinea*, which will fly till one or two in the morning. I have, for experiment-sake, sat up in the summer till three o'clock, when the whole heaven was bright with the rising sun, and moths of various kinds have never ceased arriving in succession till that time. Some of them must come from a considerable distance. *Scotophila porphyrea*, being a heath-moth, must come nearly a mile.

Moths, like butterflies, have their peculiar modes of flight, by which I can generally distinguish them on their entrance, before I can see their colours. Some announce themselves by a loud knock on the floor; this is the case with *Leiocampa dictæa*. Some ascend instantly to the ceiling; as *Agrotis corticea*. Many, I might say the majority, pass the lamp rapidly; and this shews the comparative inutility of using a lamp out of doors, where only those that loiter about it can be taken. Some have a soft and gentle flight; as, for instance, *Cosmia pyralina*, one of my most welcome visitors, whose entrance I am usually made aware of by seeing something drop down on the table, as quick as hail, but as light as a fleece of snow; whilst, on the contrary, the conceited vagaries and absurd violence of *Clisiocampa neustria*, are absolutely amusing; and *cratægi* and *populi* are nearly as bad. It is not the *Nocturna*^a alone that come to me in the night,—many of

^a When I use the term, *Nocturna*, I do it in the enlarged sense of Latreille; though Stephens prefers the term, *Pomeridiana*, for the families *Heptaliæ*,

what Mr. Stephens calls the *Semidiurna*, the *Geometridæ*, accompany them at all hours. Nor, indeed, is it *Lepidoptera* alone,—many Coleopterous insects are attracted, particularly *Oncomera podagragriæ*; and, as might be expected, the male of *Lampyrus noctiluca*. I have also occasionally been plagued by *Harpalidæ*, far from odoriferous, in great numbers; and now and then I have caught a *Colymbetes*. I am sometimes teased by swarms of small gnats; and the house-cricket has once or twice entered. *Reduvius personatus* has been amongst my captives. A few common Ichneumons and *Tipulæ* are frequent guests. But I must not weary you with details. At the same time, it may be worth while to say a word on my method of securing my prey. Suppose that, with or without using a *bag-net*, I have imprisoned a moth under an inverted wine-glass, I then light a small piece of German tinder, half the size of a sixpence, or less, and introduce it under the edge, and by means of the smoke the insect is stupified almost immediately. It is then wholly in my power, though it would quickly revive:—I pierce it; and, by means of a pin dipped in oxalic acid, and thrust into the body beneath the thorax, I prevent its revival, and fix it on the setting-board. The German tinder does not injure the colours, as brimstone would, whilst it puts the moth so completely in my power for a few moments, that the specimens I thus take and kill, are often as perfect and beautiful as if I had bred them. Of course I use it for insects taken in the day, or bred, as well as for those captured by the lamp.

Let me now proceed to give a List of the Insects, not quite common, which occur at Burghfield, particularly the *Lepidop-*

Bombicydæ, *Notodontidæ*, and *Arctidæ*. The males of many genera in these families do indeed fly in pursuit of the female in the afternoon, (*Pomeridianum tempus*), but I have taken males of the genera *Pygæra*, *Clostera*, *Cerura*, *Stauropus*, *Notodonta*, *Leiocampa*, *Lophopteryx*, *Ptilodontis*, *Chaonia*, *Petasia*, *Peridea*, *Saturnia*, *Lasiocampa*, *Trichiura*, *Pæcilocampa*, *Clisiocampa*, *Odenestis*, *Psilura*, *Dasychira*, *Demas*, *Leucoma*, *Porthesia*, *Arctia*, *Phragmatobia*, *Spilosoma*, *Nudaria*, in the dead of the night. It is obvious, therefore, that they fly in the night also, probably for the same purpose; and if they have a name to distinguish them from the rest of the *Nocturna*, it should be indicative merely of the force of attraction in the female. Perhaps the males have the bump of amativeness unusually developed. But if such a distinguishing name were given them to shew their peculiar propensity of what is called “assembling,” it must include several genera, of what even Stephens calls the *Nocturna*; as, for instance, *Anarta*, *Brepha*, *Plusia*, *Heliothis*, *Phytometra*, *Euclidia*, &c.

terous ones. Those which I do not take by the lamp, I will mark with an asterisk :—

I.—LEPIDOPTERA. (<i>Steph. Cat.</i>)		<i>Graphiphora brunnea</i>	<i>Catocala sponsa</i> *
		<i>triangulum</i>	<i>Brepha parthenias</i> *
<i>Colias Electra</i> , and the pale		<i>baja</i>	<i>Fidonia erictaria</i> *
variety *		<i>C. nigrum</i>	<i>Bupalus piniarius</i> *
<i>Leucophasia sinapis</i> *	<i>Orthosia munda</i>		<i>favillacearius</i>
<i>Pieris crataegi</i> *	<i>sparsa</i>		<i>Lampetia prosapia</i>
<i>Nemeobius Lucina</i> *	<i>miniosa</i>		<i>Amphidasis hispidaria</i>
<i>Melitæa Artemis</i> *	<i>pistacina</i>		<i>Biston prodromarius</i>
<i>Selene</i> *	<i>lunosa</i>		<i>Crocallis elinguaris</i>
<i>Argynnis aglaia</i> *	<i>lota</i>		<i>bidentata</i>
<i>paphia</i> *	<i>flavilinea</i>		<i>Geometra illunaria</i>
<i>Vanessa polychloros</i> *	<i>macilentia</i>		<i>angularia</i>
<i>Cynthia cardui</i> *	<i>Mythimna turca</i>		<i>quercinaria</i>
<i>Apatura Iris</i> *	<i>grisea</i>		<i>alniaria</i>
<i>Hipparchia Galathea</i> *	<i>Grammesia trilinea</i>		<i>canaria</i>
<i>Thecla Betulae</i> *	<i>bilinea</i>		<i>illustraria</i>
<i>W. Album</i> *	<i>Glæa rubricosa</i>		<i>Ellopia fasciaria</i>
<i>Quercus</i> *	<i>Amphipyra pyramidea</i>		<i>Hipparchus papilionarius</i>
<i>Rubi</i> *	<i>Dypterygia pinastri</i>		<i>vernarius</i>
<i>Polymnatus Argiolus</i> *	<i>Xylina rhizolitha</i>		<i>cythisarius</i>
<i>Corydon</i> *	<i>Xylophasia epomidion</i>		<i>viridatus</i> *
<i>Smerinthus Tiliæ</i> *	<i>combusta</i>		<i>Cleora bajalaria</i> *
<i>Acherontia Atropos</i> *	<i>Hadena contigua</i>		<i>Alcis conversaria</i>
<i>Sphinx Convolvuli</i> *	<i>ochracea</i>		<i>roboraria</i>
<i>Deilephila Elpenor</i> *	<i>lithoriza</i>		<i>Azinephora pulveraria</i>
<i>Sesia Fuciformis</i> *	<i>cucubali</i>		<i>Larentia cervinaria</i>
<i>Trochilium Crabroniforme</i> *	<i>capsincola</i>		<i>Cidaria quadrifasciaria</i>
<i>Ægeria Cynipiformis</i> *	<i>saponariæ</i>		<i>Harpalyce immanata</i> *
<i>Hepialus Hectus</i> *	<i>Heliophobus popularis</i>		<i>psittacata</i>
<i>Velleda</i> *	<i>Mamestra furva</i>		<i>Electra testata</i> *
<i>Carnus</i> *	<i>pisi</i>		<i>Xerene albicillata</i> *
<i>Zeuzera Æsculi</i> *	<i>Euplexia lucipara</i>		<i>Phibalapteryx vitalbata</i>
<i>Clostera curtula</i>	<i>Hama basilinea</i>		<i>Scotosia vetulata</i>
<i>Cerura furcula</i>	<i>Apamea didyma</i>		<i>Rhamnata</i>
<i>latifascia</i>	<i>nicitans</i>		<i>Triphosa undulata</i>
<i>bifida</i>	<i>Miana latruncula</i>		<i>Charissa obscuraria</i> *
<i>Stauropus fagi</i>	<i>æthiops</i>		<i>operaria</i> *
<i>Notodonta ziczac</i>	<i>humeralis</i>		<i>Chesias spartiata</i>
<i>Leiocampa dictæa</i>	<i>terminalis</i>		<i>sinulata</i> *
<i>dictæoides</i>	<i>fasciuncula</i>		<i>Lobophora henapterata</i>
<i>Prilodontis palpina</i>	<i>Scotophila porphyrea</i>		<i>sexualisata</i>
<i>Chaonia roboris</i>	<i>Achætea piniperda</i> *		<i>dentistrigata</i>
<i>dodonea</i>	<i>Miselia compta</i>		<i>Eupithecia linariata</i>
<i>Petasia cassinea</i>	<i>Polia advena</i>		<i>subfulvata</i>
<i>Peridea serrata</i>	<i>tincta</i> *		<i>venosata</i>
<i>Lasiocampa rubi</i> *	<i>serena</i>		<i>succenturiata</i>
<i>Trichiura crataegi</i>	<i>Acronycta alni</i> *		<i>elongata</i>
<i>Pæcilocampa populi</i>	<i>Thyatira derasa</i>		<i>Minoa euphorbiata</i>
<i>Psilura monacha</i>	<i>batis</i>		<i>Bapta bimaculata</i> *
<i>Dasychira fascelina</i>	<i>Ceropacha fluctuosa</i>		<i>punctata</i>
<i>Demas coryli</i>	<i>duplaris</i>		<i>Emmelesia decolorata</i>
<i>Hypercampa dominula</i> *	<i>diluta</i>		<i>luteata</i>
<i>Euthemonia russula</i> *	<i>flavicornis</i>		<i>alchemillata</i>
<i>Arctia villica</i> *	<i>Tethea subtusa</i>		<i>sylvata</i>
<i>Phragmatobia fuliginosa</i>	<i>retusa</i>		<i>bifasciata</i>
<i>Diaphora mendica</i> *	<i>Bombycia viminalis</i>		<i>rivulata</i>
<i>Callimorpha miniata</i>	<i>Cymatophora Oo</i>		<i>Hercyna clathrata</i>
<i>Lithosia aureola</i>	<i>diffinis</i>		<i>Pycheopoda virgulata</i>
<i>flava</i>	<i>affinis</i>		<i>aversata</i>
<i>griseola</i>	<i>pyralina</i>		<i>Macaria liturata</i> *
<i>Gnophria rubricollis</i> *	<i>Xanthia fulvago</i>		<i>Ennomos flexula</i>
<i>Setina eborina</i> *	<i>gilvago</i>		<i>Platypteryx lacertula</i>
<i>Triphaena fimbria</i> *	<i>croceago</i>		<i>Drepana hamula</i>
<i>interjecta</i>	<i>Gortyna micacea</i>		<i>uncula</i>
<i>janthina</i>	<i>flavago</i>		<i>falcataria</i>
<i>Cerigo texta</i>	<i>Leucania comma</i>		<i>Hyperna rostralis</i>
<i>Lytæa umbrosa</i>	<i>fluxa</i>		<i>Polypogon barbalis</i>
<i>leucographa</i>	<i>phragmatidis</i>		<i>Cledeobia costestrigalis</i>
<i>Charæas cespitis</i>	<i>pudorina</i>		<i>Pyrausta sordidalis</i> *
<i>graminis</i>	<i>Cucullia fissina</i>		<i>Hydrocampa sambucata</i>
<i>Rusina ferruginea</i>	<i>Plusia festuæ</i>		<i>nymphæata</i>
<i>Agrotis corticea</i>	<i>Heliothis marginata</i>		<i>lemnata</i>
<i>suffusa</i>	<i>dipsacea</i>		<i>stratiolata</i>
<i>vitta</i>	<i>Anarta myrtilli</i> *		<i>Margaritita cineralis</i> *
<i>cinerea</i>	<i>Ophiura lusoria</i>		<i>thapsalis</i> *

Nola encuellata
 Cloephora prasinana *
 Tortrix pillerana *
 Cnephasia lepidana *
 Sarothrips degeneranus *

Afzelianus *
 ilicanus *
 Peronea cristallana *
 favillaceana *
 tristana *
 plumbosana *
 trigonana *
 rufana *
 borana *
 asperana *
 variegana *
 gnomana *
 tripunctulana *
 bistriana *

Leptogramma liturana *
 squamana *
 Cheimatophila castaneana *
 Argyrolepia Turionella *
 Dasycera Oliviella *
 sulphurella *

Adela sulzella *
 Crambus falsellus
 Pterophorus galactodactylus *
 calodactylus *
 punctidactylus *

II.—DIPTERA.

Pedicia rivos
 Linnobia xanthoptera
 ocellaris

Atherix Ibis
 Sargus Reaumuri
 Odontomyia tigrina
 argentata
 Stratiomys chamaleon
 furcata
 Microdon apiformis
 Sphegina clunipes
 Xylota lenta
 Spilomyia femorata
 Criorhina asilica
 Sepedon palustris

III.—HYMENOPTERA.

Zaræa fasciata
 Lophyrus rufus
 Lyda sylvatica, and two new
 species
 Sirex juvenus
 Peltastes polyzonias
 Chrysis fulgida
 Cynips aptera

IV.—COLEOPTERA.

Cychrus rostratus
 Calosoma inquisitor
 Callistus lunatus
 Badister cephalotes
 Chlaenius vestitus
 Lucanus cervus
 Copris lunaris
 Typhæus vulgaris
 Omaloplia ruricola

Agrilus viridis
 Campylis dispar
 Hylobius abietis
 Alopilus triguttatus
 Rhynchites betulæ
 populi
 Saperda cylindrica
 Donacia rustica
 Cassida vittata
 rubiginosa
 nobilis
 Coccinella ocellata
 guttata
 Endomychus coccineus
 Ripiphorus Paradoxus
 Oncomera podagrarie

V.—ORTHOPTERA.

Acrida viridissima
 Locusta flavipes
 Gryllotalpa vulgaris
 Blatta Lapponica

VI.—HEMIPTERA.

Reduvius personatus
 Ranatra linearis
 Notonecta maculata

VII.—NEUROPTERA.

Raphidia ophiopsis
 Acentria vivosa?

REMARKS.—*Polyommatus Corydon*.—I mention this, not as rare, but because there is no chalk near. I have only taken one specimen here.

Thecla W. Album.—This appeared in the greatest profusion in my garden, five or six years ago.

Gortyna flavago.—I took the pupæ in the hollow of large thistles, in July, 1832.

Achatea piniperda.—The pupæ lie just under the moss, in fir plantations.

Leucania.—In this genus I formerly included what I now find, from Curtis's British Entomology, to be *Nonagria Vectis*. I took it amongst the rushes at Black Gang Chine, in the beginning of July, about eight years ago.

Cucullia.—In this genus, *Asteris* has been taken at Bradfield, six miles hence; as also *Orichalcea*, in the genus *Plusia*.

Acentria nivosa.—My specimen was so named for me; but I have reason to think it will belong to a new genus, about to be named by Mr. Stephens. I took it six or seven years ago.

Cynips aptera.—Several specimens were found in cavities within a root something like a ground-nut, dug up in the fields, and lying on a heap of dirt. I could not find the leaves of the plant, nor could any one distinguish the root.

ART. V.—*Thoughts on the Geographical Distribution of Insects.* By DELTA.

Tramite quo tendis, majoraque viribus audes ?

SIR,—Perhaps there is no branch of Entomology more worthy of attention than the geographical distribution of insects; yet this is totally disregarded by almost every entomologist. He who carefully excludes from his collection of British Insects every doubtful species, arranges in his exotic cabinet species after species, genus after genus, without once thinking of indicating the part of the world whence they may have been obtained; or, if he does note this, it is in so general a manner, that little is to be learnt from it,—a line of one of six different colours, which serve to indicate Europe, Asia, New Holland, Africa, and North and South America, being thought abundantly sufficient.

In Dejean's *Cat. des Coléoptères* we certainly find the native country of each species pointed out rather more clearly; but sometimes, even there, we are left to guess as to what part of a region, extending over 50° of latitude, and as many of longitude, and offering, at its two extremities, a difference of 30° Fah. of temperature, is the principal station of an insect. Besides this deficiency in exactness, there is an omission of still more consequence:—no notice is taken of the range over which a species extends.

From this want of care and accuracy in pointing out that country which is the principal station of a species, and the extent of its range over other countries, arise difficulties, which overwhelm us in our attempts to arrive at any thing like a correct view of the geography of insects; and which, joined to our limited knowledge of extra-European species, forbid our speaking with confidence on any part of this subject. It has been well and truly observed with regard to plants, by an illustrious traveller, that it is impossible to enter fully into their geography unless we are thoroughly acquainted with the distinctions, the characters, and the names of each species:—
“Ne tamen obliviscare, quemadmodum Physiologia animalium sine Anatome esse non potest, neque Geologia sine Oryctognosia, eodem modo te Geographiam Plantarum penitus inspicere non posse, nisi Botanicæ innitens, singularum

specierum notas, characteres, nomina accuratissime dignoscas." It would be fruitless for me, possessing so limited a knowledge of species as I do, to attempt to point out the geographical distribution of either species or families: this also is far from my plan. I merely wish to point out, with the utmost diffidence, in what I suppose others to have erred, and to show what it is that our attention ought to be directed to. To detect and avoid error is one step gained towards arriving at truth:

Virtus est vitium fugere, et sapientia prima
Stultitia caruisse.

Were we to follow the plan adopted by Humboldt, in his excellent *Prolegomena de Dist. Geog. Plant.* we should commence by estimating the total number of insects already known, and proceed to calculate what portion of them belong to the polar circle, the temperate zones, and the regions between the tropics, and also the relative proportions which the different classes bear to one another in different latitudes. But so little attention is paid by foreign collectors to any classes but *Lepidoptera* and *Coleoptera*, that we are left without any precise data on which to found our calculations. Were we to judge from what we see of foreign insects, we should be led to believe that these two classes increase in number of species as we proceed from the poles towards the equator much more than the other classes; but this is greatly to be doubted. Perhaps in the *Hymenoptera*, *Diptera*, and *Neuroptera*, the countless myriads of individuals of particular species which occur in the warmer regions, may have some influence in diminishing the general number of species; and therefore there may be some reason for believing these classes not to increase in an equal ratio with the others. Moreover, a large proportion of the *Neuroptera* are aquatic in their larva and pupa states, consequently these families are less likely to be rich in species in regions like the intertropical parts of the world, where almost every stagnant water, excepting the large lakes, is evaporated during the dry season, and where most of the smaller streams partake of the character of torrents. We find aquatic insects to be in general much less influenced by climate than terrestrial. In *Coleoptera*, the largest species are inhabitants of the temperate zone; and, of the three hundred and twenty-three species of *Hydrocanthares* indicated

in Dejean's Catalogue, only about one-fourth belong to the tropical parts, whilst in the terrestrial *Adephaga* the proportion is about one-third. In the *Libellulæ*, those from equatorial regions yield in *bulk* to our own, although in some species the abdomen is of extraordinary *length*. Those *Lepidoptera* also, which in the larva state may be almost termed aquatic, offer no striking difference in size between those from within the tropics, and from the northern parts of the temperate zone. We have therefore good reason for believing that aquatic insects are but little influenced by climate, a conjecture rendered the more probable by the wide range of certain species which are found to extend from lat. 45° north to lat. 10° south; and to be common to the Old and New World.

The proportion of aquatic *Hemiptera* is so small, and so nearly that of *Coleoptera*, that we cannot suppose this order to be less influenced by climate; and the *Orthoptera*, being altogether terrestrial, are, of all classes, the most exposed to this influence.

Had we sufficient data, it would be well worth inquiring what proportion the number of species in each of the great divisions of the globe bears to the whole, and also in what ratio the species in a given space increase in number as we proceed towards the equator. Perhaps, if we reason upon what has been observed with regard to plants, we may arrive at more correct conclusions than if we trust to our more imperfect knowledge of foreign species.

Humboldt states, that, of 38,000 species of plants described and preserved in *Herbaria*, 7,000 belong to Europe, 6,000 to Asia, 3,000 to Africa, 5,000 to New Holland and the Isles of the Pacific, and 17,000 to America. The ratio of increase in proceeding southwards, for latitudes 68° , 45° , 0° , is as 1 : 4 : 12. This is, in all probability, nearly the case in insects.

Another point to which our attention should be directed is the proportion which the number of genera bears to that of species. In plants, we find, whether we proceed towards the poles, or the summits of lofty mountains, that the number of species diminishes much faster than that of genera: "Nam in regiones cum frigidis, tum aridas genera zonarum propinquarum semper unam alteramve speciem quasi colonos immittunt: unde fit numerum generum magis ibi crescere quam specierum."

In comparing the productions of places situated under the same parallel of latitude, but differing greatly in longitude, reference must always be had to the inflexion of the isothermal lines, and also to the difference between the mean summer and mean winter temperature. If, in our idea of the mean temperature of a place, we are guided solely by latitude, we shall err most surprisingly. Pekin and Philadelphia are nearly 2° more south than Rome, yet at Rome we find the mean temperature 15.8° centigrade, whilst, at the two former, it is only 12.7° cent., a difference of 3.1° cent. degrees, about 5.6° of Fahrenheit's scale. The mean summer and mean winter temperature offer still greater differences: at Rome, the latter is $+7^{\circ}.7$; at Pekin, $-3^{\circ}.1$; at Philadelphia, $+1^{\circ}.1$; the former, at Rome and Philadelphia, is 24° , at Pekin, $28^{\circ}.1$. If we proceed westward, from the shores of the Atlantic, until we arrive at the basin of the Mississippi, we shall find the mean temperature about 2° Fah. less than on the coast at the same latitude, a difference which would increase as we proceeded towards the Rocky Mountains, were not the summers so extremely hot as in some degree to counterbalance the intense cold of the winters.^a The temperature of the western coast of North America appears to differ but little from western Europe. In the eastern parts of Europe the temperature more nearly resembles that of America on its eastern shores: Nicolaieff, on the Black Sea, about 5° of latitude south of us, having a mean temperature of about 2° Fah. less than ours.

In tracing the changes of form, which are observable in insects, as we proceed towards the equator, we must remember that it is only from those inhabiting the parts but little elevated above the level of the sea that our inferences should be drawn. If we disregard the effect of elevation we shall be sure to fall into error. *Styraciflua liquidambar*, which, at Xalapa, clothes the sides of the mountains at an elevation of three or four thousand feet, in New England is met with only in the plains. Its true climate, therefore, is not that of Mexico, but of the northern parts of the United States. The same will hold good with regard to insects; and therefore we have no right to call an insect tropical unless we know the elevation of the

^a At Council Bluffs, on the Missouri, the thermometer has a range of 129° Fah., or from -21° to $+108^{\circ}$.

parts which it inhabits, and how far the effect of that elevation is increased or diminished by peculiar local circumstances.

But we must not suppose that the insects of an elevated region will altogether resemble those of a neighbouring more northerly region where the mean temperature is the same. The productions of a country are influenced, as I before remarked, by its mean annual temperature, its mean summer and mean winter temperature, and by the greater or less difference between these two last. Hence, if we compare the birds, insects, or plants of Europe, with those from the eastern parts of North America, which have a corresponding mean temperature, we shall find those of America to bear a much greater resemblance to those from the tropical regions of that continent than ours do to those of any part of Africa south of the Great Desert. This may be accounted for by the great heat of the summers in the Atlantic States, which fully equals, if it does not exceed, the common temperature of the low regions of the tropics. Perhaps, also, that great ocean of sand which extends from the western shores of Africa to the Persian Gulf, with scarce any interruption, may, conjointly with the Mediterranean, have obstructed the spread both of animals and plants towards the north. No species of that lovely group, which may be called the humming-birds of the Old World, has ever been found to visit Europe; and our summer visitants, finding in the northern parts of Africa, amongst—

—groups of lovely date-trees bending
Languidly their leaf-crowned heads
Like youthful maids, when sleep descending,
Warns them to their silken beds,—

a climate entirely conformable to their habits, never make the fruitless attempt to cross the desert.

But in the New World nothing occurs to prevent the spread of species as far north as their organization will allow; and therefore we find some of the birds of its equinoctial regions, summer visitants, even of the inhospitable regions of Canada. *Trochilus colubris*, I believe, has been found as far north as lat. 54°.

On the eastern shores of America and Asia tropical forms are intermixed with those of the temperate zone in an extraordinary manner. *Bamboos*, *Cycadææ*, *Epidendra*,

intermixed with pines, or *Limodoræ*, *Cacti*, *Passifloræ*, *Bignoniæ*, *Lauri*, *Magnoliæ*, and palms mingled with the northern forms of oaks and firs, offer a landscape of unequalled variety. In insects we find the same singular mixture; and whilst many of those of the United States so nearly resemble our own, as at first sight to raise a doubt of their being distinct, others are so lovely, so tropical in form and hue, that we find it difficult to believe them inhabitants of a country where the winter frosts impede the navigation of the rivers.

The irregular distribution of heat over the surface of the globe, and the variety of other causes which affect the development of insects, forbid our dividing the globe into insect climates, which are to extend over so many degrees of latitude and longitude, as proposed by Latreille, who, after objecting to the divisions of Fabricius, as artificial and vague, proceeds to divide the globe into certain divisions, each of which is to be considered as a peculiar insect climate.

He commences by separating the globe into three portions: the first dividing line extends, from pole to pole, in long. 31° W.; the second is nearly identical with the 66th eastern meridian; and the third with the 175th western. Thus we have three great divisions: one, containing Europe, the Azores, Iceland, part of Greenland, Africa and its islands, and the western part of Asia. The second comprises the middle and east of Asia, the great continent of Australia, and some of the isles of the Pacific. The third division, including all America, the Sandwich, Society, Friendly, and part of the Marquesas Islands, is divided into equal portions by a line nearly corresponding with the 106th meridian.^b

These are again divided by lines parallel to the equator, and distant from each other 12° of latitude. Beginning at lat. 84° N. and 60° S. we shall thus have twelve climates for each of the great divisions; namely, seven Arctic, and five Antarctic, distinguished by the terms, equatorial, tropical, supra-tropical, intermediate, superior, subpolar, and polar; the two last only in the Arctic climates. These are again divided at every 24th meridian. Without remarking on the impropriety of

^b In converting the longitudes into our own way of reckoning them, I have allowed only 2° for the difference in longitude between Paris and London. This is not quite enough, Paris being 9 min. 21.6 sec. east of Greenwich.

including New Holland in the same division as Asia, and separating these from the isles of the Great Ocean to add them to America, we will just consider how far the smaller divisions are consonant with nature.

America has always been the land most dear to my heart. Her boundless forests, her stupendous mountains, her unrivalled rivers, her lakes, her cataracts, have haunted my imagination from my earliest youth. I had hoped to have passed my younger days in exploring the endless treasures that her fruitful regions offer to the naturalist; and, should my life be lengthened to a longer date than it now in all probability will be, to have passed my more advanced years "en el retrato lisongero que ofrèce este pais virtuoso y feliz, mientras otros muchos del globo no presentan mas que escenas de ruina y de miseria." But, "dis aliter visum est." Nevertheless, my mind is constantly recurring to those lands so dear to it; and, therefore, when reflecting on the subject of these divisions, I naturally began with considering how far they would agree with nature in the New World. We shall soon see the result.

North America is divided into two unequal parts by a line nearly agreeing with the 103d meridian. It is to be again divided by lines in latitudes 72°, 60°, 48°, 36°, 24°, and 20°; and these subclimates are again to be divided by lines distant 24° of longitude. But does this agree with nature? is this in accordance with the inflection of isothermal lines? are the natural boundaries attended to? I will merely point to that space comprised in the western intermediate subclimate, which includes the basin of the Colombia, the northern plains of New Mexico, the sources of the Missouri and Platte, and nearly the whole course of these two rivers until their junction. This surely is a division containing countries as different in climate, soil, and productions, as can possibly be found. The plants of the east of Asia differ less from those of the territory of Oregon than these last from those of the regions east of the Chippewayan. The isothermal lines which decline towards the south until they reach the Chippewayan or Rocky Mountains, suddenly bend northward after crossing this chain. Let any one who has read the travels of Lewis and Clarke across the Chippewayan to the Pacific Ocean call to mind the extraordinary change of climate which they found on crossing those

mountains. On the eastern side, the climate is dry to excess, the vegetation scanty, scarce offering food sufficient for any of the larger quadrupeds. The bison, which, more to the east, roam in herds of fifteen or twenty thousand, no longer find food for their countless numbers; a few argalis (*Americè, big-horns*) and a straggling antelope are the sole occupiers of these sterile plains; scarce a tree enlivens the desolate landscape; rain is rare, but at times descends in torrents. Though the summers are extremely hot, the winter temperature often reaches the point at which mercury congeals, but is rendered less difficult to bear by the great dryness of the winter months. But how different is every thing to the west of the mountains. Close to their base the climate is mild and dry; but, as we advance to the shores, it becomes more and more rainy, resembling much that of Ireland. The winters are mild, scarcely ever frosty, but the rains are continual; the summer moderately warm, with frequent rains. The vegetation is here totally different; and, instead of being barren of trees, the firs often exceed three hundred feet in height. Can any suppose this to be rightly considered as a subclimate, the insects of which are to resemble one another as much as those of the department of the Seine resemble those of Prussia?

Again; let us turn to South America, and survey the space bounded by the 79th and 55th meridians, and by the 12th northern parallel and the equator. Is this an insect climate or subclimate? assuredly not. But first how are we to understand these terms? I should define them thus. Nature has given to each species certain assigned limits; these it cannot pass. In some the greater degree of flexibility of organization enables them to extend over a wide space, but of others the range is much more confined. Certain forms also are peculiar to certain regions. Supposing that we start from any fixed point, we will say the extreme northern limit of insects, and proceed southward until the greater portion of species differ from those we have left behind us, and the general form is materially altered; we have now arrived at a new subclimate; proceed farther, until we find the whole, or nearly the whole, of the species different, and these new species presenting a different general form, we have now reached a new climate. The same will apply, if we suppose

that our course is directed parallel to the equator, or rather if it follows the direction of the isothermal lines.

In the want of a sufficient knowledge of the country, we may be guided by its natural boundaries, the course of rivers, the direction of mountains, the interposition of deserts, &c. Spix and Martius remark, that most of the great tributaries of the Marañon have a peculiar flora; Burchell remarks, that the Great Karro is the limit of Cape plants, nearly all the plants from the banks of Gariep and the country adjoining being entirely different; and lastly, Latreille observes, that lofty chains of mountains are mostly real limits in the geography of insects, and therefore it is not surprising that *the insects of New Granada are totally different from those of Cayenne and Demerara*. This last remark is true, very true; but we shall see how entirely in his distribution of subclimates he has overlooked this circumstance. I have before observed, that in all things relating to the division of the earth into insect-climates we have nothing to do with mountains, except in so far as they form natural boundaries which prevent the spread of species beyond them.

Let us return from this long digression to that subclimate which includes the Republic of New Granada and Venezuela, part of that of the equator (del Ecuador), Demerara, Berbice, parts of Surinam, of French and of what was Portuguese Guiana. First, we have the shores of the Pacific; and what relation have the insects from those shores to those of the shores of Cape Paria? Are not these regions separated by snow-clad mountains, whose summits are never looked down upon by any earthly being save the condor? Do not these mountains mark the limit which the western species cannot pass? If we follow the shores of the Atlantic as far as the 55th meridian, we arrive at that very country the insects of which Latreille has pronounced to be totally different from those of New Granada, even to the east of the Magdalena; and moreover, this region, which stretches from the mouths of the Oronoco to that of the Amazons, is divided by a line which separates Cayenne from Berbice and Demerara. Guiana, or the country included between the Rio Negro, the Oronoco, and the Maranon, is a vast Hylæa, a level and almost uninterrupted tract of forest, which cannot be better described than in the words of the illustrious Prussian traveller:—"Sylvæ

sumanæ vastitatis, ob æstus fere intolerabiles immanibus serpentibus, crocodiles, tigride jaguare atque vario et malefico genere animalium infestæ."

In some places this general character is modified by peculiar local circumstances, but still every where is to be found an excessively luxuriant vegetation. "Forests, the growth of thousands of years, of an impenetrable thickness, fill the humid country situated between the Oronoco and the Amazons. Immense masses of lead-coloured granite narrow the foamy beds of the rivers. The mountains and woods resound unceasingly with the roar of cataracts, the growl of the jaguar, or the dull howl of the red monkey, which foretells the approach of rain. In those places where the lowness of the waters leaves a sandy beach uncovered, with open mouth, but motionless as a rock, lies a crocodile, whose scaly body is covered with birds. The tiger-marked boa, his tail fixed round the trunk of a tree, his body rolled upon itself, sure of his prey, lays in ambush on the bank; suddenly he uncoils to seize the young bull which is just passing." Such is the picture which Humboldt, in his beautiful "*Tableaux de la Nature*," has sketched of these regions. Such are the characters of a country, one-fourth of which is excluded from this subclimate, whilst those low level plains, which bound it on the north, and of which the following picture has been drawn by the same traveller, are included in it.

"At the foot of the chain of mountains which resisted the violent action of the waves, when in the early age of our planet their irruption formed the Gulf of Mexico, commences a vast plain which stretches beyond the reach of sight. When we have left behind us the smiling vallies of Caraccas, and the Lake of Tacarigua, sprinkled with islets, and reflecting in its waters the images of the plantains with which it is surrounded; when we have quitted the fields adorned by the tender verdure of the sugar-cane of Taiti, or the bowers shaded by the thick foliage of the cacao, the view is borne towards the south, over steppes or deserts, which rise insensibly, and terminate the horizon in a distance without bounds. Quitting those places where Nature is so prodigal of organic life, the astonished traveller enters upon a desert devoid of vegetation. Not a hill or rock rises like an island in this immense void." In the dry season, not a plant is to be seen save a few *Mauritia* palms

and the *Melocactus*, whose spines the mules remove with their fore-feet to drink the refreshing juices contained under its spherical envelope. At length the season of the rains arrives, and "hardly is the surface of the earth moistened, when the desert is clothed by *Killingia*, and an infinity of *Gramineæ*. In the morning, the herbaceous sensitive plant opens its drowsy leaves to salute the rising sun, as do also the aquatic plants, by opening their delicate flowers, and the birds, by their songs." The boa and crocodile, which have remained torpid, buried in the ground during the dry season, rise as from their tombs;—all nature is reanimated. But, alas! after suffering all that can be caused by extreme drought, these unhappy regions are doomed to undergo the opposite extreme. The floods spread, until nearly the whole of the lands are a vast lake, only to be dried up by the action of the sun in the dry season. Surely, the productions of this region can bear no relation to those of the Hylæa of the Oronoco, or of the valleys of Cape Paria, Caraccas, or Santa Martha.

This will serve to show the impropriety of neglecting to regard natural boundaries.

I am yours, most truly,

Δ.

(To be continued.)

ART. V.—*Entomological Society.*

FIRST SITTING.—NOVEMBER.

SINCE the meeting in May, the proceedings of which we published in our fourth number, the council of the Entomological Society has been unremitting in its exertions. A code of bye-laws has been prepared; rooms have been engaged and furnished; and a collection has been made already rivaling in extent, surpassing in accuracy of nomenclature and neatness of arrangement, most of our metropolitan cabinets.

On Monday, agreeably to advertisement, the members of the Society met at 17, Old Bond-street. When we entered the room, about twenty minutes past eight, we found it quite crowded with the leading entomologists of the day: we also

remarked that a considerable number of ladies were present; this we announce with great pleasure, for their countenance is, in every undertaking, an earnest of success: we understand that ladies are eligible as members, and that several have already joined the Society. Among the gentlemen present, we recognized the Rev. Mr. Kirby, who had the same day, as we heard, travelled to London expressly to attend the meeting, and Mr. Spence, Mr. Kirby's coadjutor in the great work with which every entomologist is acquainted.^a

The chair was first taken by MR. CHILDREN, who said that, before proceeding to the regular business of the Society, he must trespass a few minutes on the attention of the meeting. He was delighted to see before him so numerous and so distinguished an assembly; a delight greatly enhanced by the presence of ladies. The object of the Society was to study the forms, the habits, the economy, he might say, the moral character, of insects. He could remember the time when the idea of associating for such a purpose would have been treated with ridicule and contempt, but happily a very different feeling now prevailed: we were now beginning to perceive that *Natura nusquam magis quam in minimis tota est*. Many gentlemen present would be aware that this was not the first attempt that had been made in this country to establish a similar society; he would not dwell on the cause of want of success in that instance, but he would say, and say with all his heart, let the proceedings of the present Society be conducted with peace, good-feeling, and unanimity, and then it *must* succeed. *Concordiâ parvæ res crescunt; discordiâ maximæ dilabuntur*. This was, in fact, the first meeting of the Society; a previous meeting had indeed taken place, at which officers had been appointed and formal business arranged, but that must be looked on as merely a preliminary meeting. He would remind the meeting, as an incentive to exertion, of the establishment and present prosperity of an Entomological Society in France: that Society has been joined by most of the first entomologists of Europe, and had already published a volume and a half of valuable scientific Transactions: that Society had unanimously elected the great patriarch of the science, the late illustrious Latreille, to the office of Honorary

^a Kirby and Spence's Introduction to Entomology. We only record the presence of honorary members and distinguished visitors.

President. This Society had followed the example; we had our patriarch as well as France; a patriarch who had laboured for years in the cause of science—a patriarch in every way worthy of a similar honour; if France had reason to be proud of her Latreille, so had England of her Kirby. He warmly congratulated the meeting on the presence of the distinguished individual to whom he alluded, and he was sure the meeting united with him in the sentiment. (*Applause.*)

Mr. KIRBY rose, and expressed his thanks to the President for the kind manner in which he had spoken of him, and to the Society for the honour that they had conferred on him, and for the flattering marks of their approbation. He could not make a long speech, but he assured the Society that all he could do to advance its interests he would do; at seventy-four years of age, he trusted that much could not be expected of him; he found that his eyes began to fail him, and without eyes an entomologist could do but little: he could not sit down without reminding the meeting that the world was indebted for most interesting and important portions of the work, of which his own name stood conjointly as author, to his friend beside him;—and the reverend gentleman laid his hand affectionately on the shoulder of Mr. Spence, and was unable to proceed; during the pause, the meeting loudly expressed their gratification in the scene. Mr. Kirby hoped that Mr. Spence might be elected an honorary member, saying, that he considered him as much deserving of that honour as himself.

The PRESIDENT then proposed, that Mr. Spence be elected an honorary member, which was carried by acclamation.

Mr. SPENCE, in returning thanks, avowed that he had attended the meeting, with his two sons, for the express purpose of joining the Society; he was much gratified to find his favourite study in such good esteem, as the establishment of this Society, and the magnitude of the present meeting, proved it to be. He had lately returned from the continent; when in France, he had seen Mr. Lefebvre, the Secretary of the French Entomological Society, who had expressed his warmest wishes for the welfare of the English one, and his hopes that the two Societies would commence, and continue, an amicable intercourse.

The PRESIDENT said that, having opened the proceedings of

the meeting, he should now vacate the chair in favour of the Honorary President. As soon as Mr. Kirby appeared in the chair, so legitimately his own, he was received with a simultaneous and most enthusiastic burst of applause; we have never before, at a scientific meeting, witnessed such a scene; the worthy man was quite conquered by his feelings, and sat down at last unable to utter a single word.

The SECRETARY then read a code of By-laws.

It was proposed and resolved, that Mr. W. B. Spence be appointed Foreign Secretary to the Society.

Mr. W. B. SPENCE returned thanks.

It was proposed, seconded, and resolved, that the thanks of the Society be given to Mr. Yarrell, for his obliging and unremitting exertions in engaging and furnishing apartments, and his zealous attention to the interests of the Society.

It was proposed, seconded, and resolved, that the thanks of the Society be given to Mr. Waterhouse, the Honorary Curator, for his assiduous services.

It was proposed, seconded, and resolved, that the thanks of the Society be given to Messrs. Hope, Newman, and Davis, for their kind and laborious exertions in framing and preparing the By-laws of the Society.

The FOREIGN SECRETARY then read a most interesting account of a meeting of the German naturalists at Breslau. As he was proceeding,

Mr. SPENCE, sen. rose, and said:—I beg, Sir, to be allowed to interrupt a moment, and offer a few words in explanation. The fly described by Dr. Hammerschmidt, which has proved very injurious to the wheat in Bohemia, is a species of *Cecidomyia*; and it is not a little remarkable, that Dr. Hammerschmidt should have given it the very same name which you applied, Sir, to a species some years back; *Cecidomyia Tritici*. It is, however, very different from that insect; the injury done by Dr. Hammerschmidt's *Cecidomyia* is occasioned by the larvæ eating into the stem, and thus weakening the plant; whereas, Sir, your insect fed on the flowers of the wheat, and thus prevented their fructifying. Its characters also are very different. The destructive Hessian fly, described by the American entomologist, Mr. Say, appears to be a species of the same genus, but certainly differs from both the others; the immense destruction it causes is said to be occasioned

—and if it should prove so, it is a very singular fact—by the pressure of the pupæ against the grain while in a tender and immature state. I beg, Sir, to call your attention, and that of the meeting, to the great advantage which our agricultural interests would derive from a close and minute investigation of the economy of all those minute but injurious animals which prey upon our crops, and to observe how important it is to acquire a knowledge of this before attempting the application of a remedy.

The FOREIGN SECRETARY finished reading the communication.

The HONORARY PRESIDENT then announced, that the next meeting would be held on the first Monday in December, and future meetings on the first Monday of each succeeding month, and that the chair would be taken at eight o'clock precisely; also, that the time for original members joining the Society had been prolonged to the first of January, 1834, in order to allow ample time for those enrolling their names who might not, previously to the present meeting, have been made acquainted with the plan and objects of the Society.

SECOND SITTING.—DECEMBER 2.

The room was excessively crowded; a considerable number of members not even being able to find seats. This will, we believe, be remedied before another meeting, arrangements having been made for the introduction of several more benches. The fact is, that even the most ardent of the originators of the Society formed no idea of the magnitude and importance which it was so soon to attain. We observed in the room Mr. Spence, Dr. Grant, Dr. Roget, &c.

The SECRETARY read a "Paper on the Nomenclature of the Parts of the Head of Insects, by Mr. Newman."^b Some pen and ink drawings, illustrative of the subject, were handed round the room.

The SECRETARY read a "Paper on the Hessian-fly," handed by Mr. Spence, stating, that published accounts of this insect were full of inaccuracies.

Mr. SPENCE made a few observations in explanation.

The PRESIDENT read a letter from Mr. Westwood, calling the attention of the Society to the entomological affairs of the

^b See Article VI.

Linnæan Society, especially to a paper of his own on *Diopsis*, a very singular genus of Diptera, having the eyes placed on long foot-stalks. Mr. Westwood will continue to report any entomological matter that may come before that Society.

The Rev. F. W. HOPE read a paper by himself, technically describing some newly-discovered and very remarkable forms of Coleopterous Insects, which we should have been pleased to publish, but we accidentally heard that Mr. Hope intended them for some other destination. When this is the case we shall make it an imperative rule to be silent. Beautifully finished drawings, illustrative of the species described, were exhibited.

The CURATOR then came to the table, and with that air of genuine modesty which is ever the companion of true genius, made the following communication. I believe it has been supposed by several writers, that the mandibles of Lucanus (the Stag-beetle) are designed for perforating the bark of trees, and thus causing the sap to flow, on which the insect is said to feed; but I do not recollect ever seeing this confirmed on positive authority. During the past summer I kept a stag-beetle alive for several weeks: I allowed him to bite my finger with his mandibles, which he did with great strength and perseverance for some seconds; and immediately, on relaxing his hold, applied alternately one of his antennæ and the galea of his maxillæ to the indentation, as if to ascertain whether any moisture was flowing from the wound. The stag-beetle has a small patch of golden-coloured hair near the base of the fore-leg, the use of which, I believe, has never been pointed out:—it is evidently for the purpose of cleaning the antennæ, which, after touching saccharine fluids, become sticky. The insect does this in the most adroit manner, bending back the antenna and placing it beneath the leg, and then drawing it out slowly. The specimen which I had became after a time tame and playful, sometimes amusing himself by tossing about a ball of cotton with his horns. He was very fond of sugar moistened, and of the juice of raspberries.

The PRESIDENT alluded to the lamented death of Mr. Haworth; and proposed that a minute should be made expressive of the esteem of the Society for the deceased, and regret at his loss.

ART. VI.—*Osteology, or External Anatomy of Insects.*—
By EDWARD NEWMAN, ESQ., F. L. S.

(Continued from Vol. I. p. 413.)

"I find it impossible to give, according to the present state of the science in England, any satisfactory description of insects without making some previous observations on their anatomical nomenclature."

MACLEAY.

"Ce que personne n'avait encore tenté j'ai osé l'entreprendre.

SAVIGNY.

LETTER II.—ON THE HEAD OF INSECTS.

[Read at the Entomological Society; sitting of the 2d December.]

SIR,—It has been already stated, that an insect is composed of thirteen segments, and that of these the head is the first. It appears scarcely to admit of a doubt, that the head of an insect is composed of four distinct portions. That the portions of the head are merely sections, appears to me consistent with the general harmony of Nature.^a The second segment in the locust tribes, and the third segment in the bee tribes, present to the inquirer a quadruple division by far more manifest. You will however remark, and it is of no mean importance, that, while the portions of the second, third, and following segments, are united by suture, those of the head have a freely moveable articulation. That the portions of the head are segments, is argued from the circumstance, that those organs which in one group are employed for manducation, in another serve solely for progression. When this is the case, the organs thus modified differ in no material characters from those of the second, third, and fourth segments. Consequently, it is said, that by their increase of importance to that of true organs of locomotion, they also raise the portions which bear them to an importance equal to that of those portions which uniformly bear such organs.

These changes in the uses to which organs are applied we frequently detect in progress in intervening groups. They afford the most obvious distinguishing characters. A man is termed a biped; a horse, a quadruped; and not incorrectly: yet the number of limbs in each is the same. In man, the first pair of limbs is essential to feeding; in

^a The segments of the head, which are sometimes three, but typically four, are therefore of course only to be considered as secondary.—MacLeay.

Fig. 1. A.



Fig. 2. B.

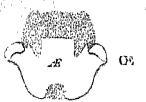


Fig. 3. A.

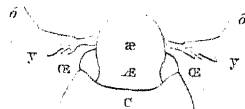


Fig. 4. i.



Fig. 5. o.

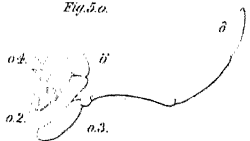


Fig. 6. u.

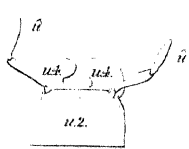


Fig. 7. x.

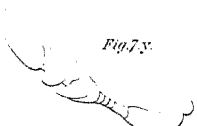


Fig. 9. o.

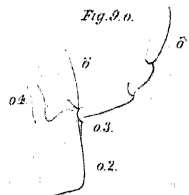


Fig. 8. a.



Fig. 10. o.

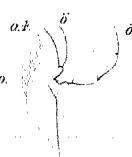


Fig. 11. o.

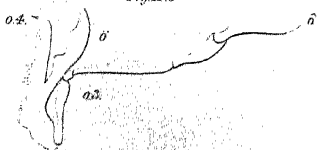


Fig. 12. o.



Fig. 13. o.



Fig. 14. o.

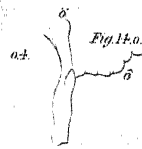


Fig. 15. A.

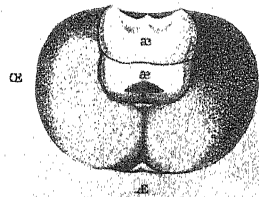
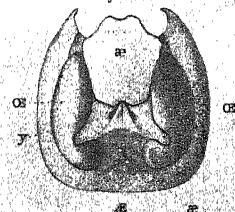
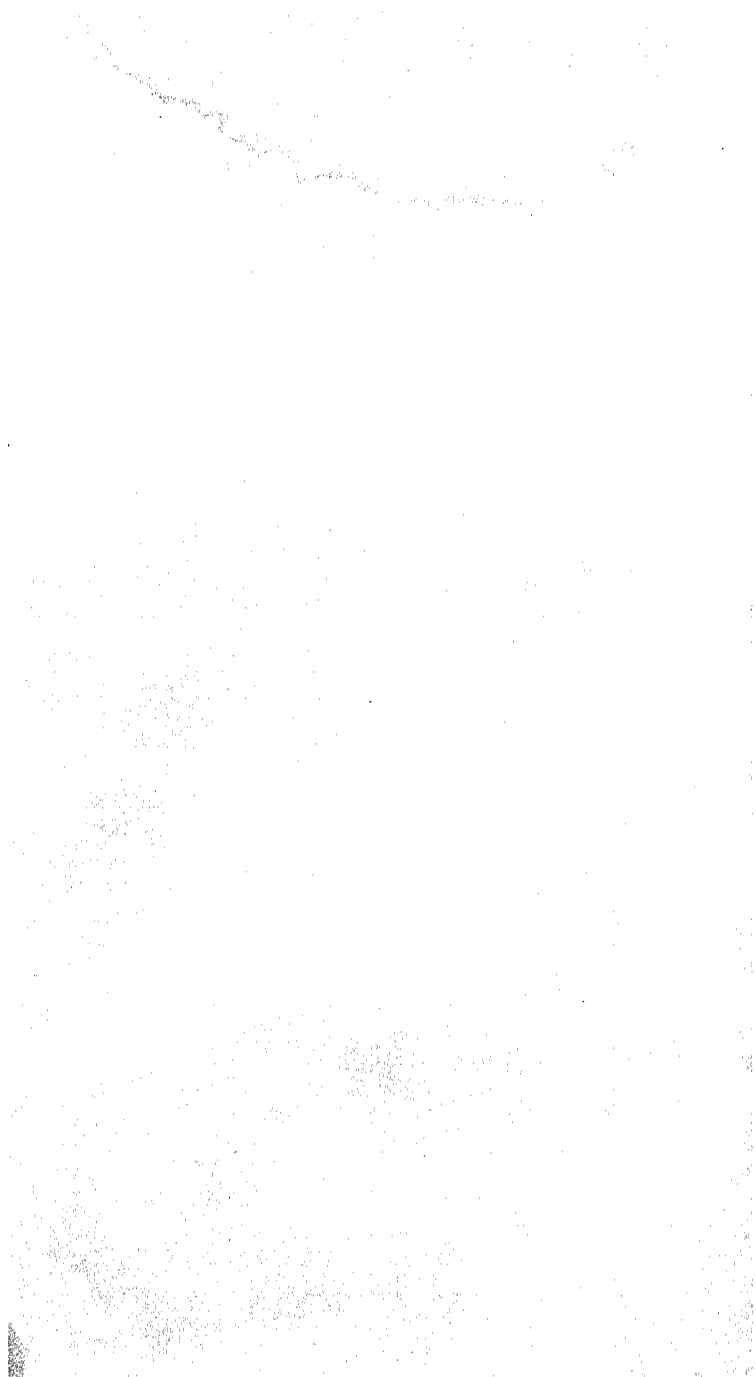


Fig. 16. A.





the horse, these are purely organs of locomotion, and differ in no respect from the other organs destined to the same end; but in many animals we find them applied with perfect ease to either purpose. The adaptation of the same organs to different purposes in the superior animals is obvious; consequently, in the inferior, fairly to be inferred. Conclusions of this kind have been stigmatized as theoretical. Be it so: theory may be sound as well as unsound. When theory is a compound, of which facts are the ingredients, it is sound. In the present instance, facts are the ingredients. Whether the four portions of the head be primary or secondary parts, —in other words, whether they be segments or sections of segments, seems to hinge on another question; *viz.* whether a single segment can bear four feet; for it seems scarcely to admit of a doubt, that, in some annulate animals, the part which is analogous to the head of tetrapterous hexapods has four organs of progressive motion employed as feet. This circumstance appears to me by no means more remarkable, than that the third and fourth segment should each bear four organs of progressive motion, two of them adapted to walking, and two to flight. On these grounds I have considered the four parts of the head as so many sections of a segment, and consequently equivalent to the sections of succeeding segments. To give them the same names, however, while a doubt remains, would be objectionable; more especially, as a nomenclature sufficiently definitive has been long established, although in its application confused and various. The parts of the head are the skull, the lips, the feeler-jaws, and the mandibles. These are the four sections of a segment. To simplify and conform to received ideas, the three last must be treated of as the *mouth*, of which, in tetrapterous hexapods, they constitute the component parts.

The skull of insects is compact, solid, and osseous. It has a large opening in front, in which is situated the mouth; another behind, through which pass the *œsophagus*, spinal cord, blood-vessels, muscles of connexion with the *prothorax*, &c.; and two smaller ones, generally in front, above that of the mouth, in which are placed the antennæ. There are two compound eyes, one on each side, so closely soldered into the skull, that, in case of fracture, the separation does not take place at the suture. Desvoidy well observed, that the eyes

form the lateral regions of the skull. Besides these compound eyes, insects have generally two or three *ocelli*, or simple eyes. These, like the true eyes, are firmly fixed in the skull, and are alike incapable of being separated from it without fracture. The simple eyes are situated usually on the crown of the head; their number is generally, in *Lepidoptera*, two; in *Diptera*, three; in *Hymenoptera*, three; in *Coleoptera*, none;^b in *Orthoptera*, three; in *Hemiptera*, two. With the exception of the compound and simple eyes, the skull is a single, continuous, and undivided piece. Entomologists have endeavoured to assign names to the different regions of the skull, but have hitherto been unable to establish them. It cannot be too frequently or too emphatically repeated, that names of parts having unfixed limits are objectionable, as leading to confusion. An author might establish his nomenclature from a single species, provided inquiry was directed to that species alone. The anatomy of a beetle's or locust's skull gives us scarcely any idea of that of a butterfly's. A nomenclature well adapted to the skull of a cockchafer would be useless for that of a dragon-fly. Fabricius describes no parts but the forehead, *clypeus*, throat, and simple and compound eyes. Latreille, Burmeister, and many others, recapitulate the labours of preceding writers. Desvoidy is original, precise, and clear, but his nomenclature is adapted solely to *Diptera*.^c

^b In the fourth number of Germar and Zincken Sommer's Magazine, it is affirmed, that they are discoverable in Gravenhorst's genus *Omalium*, but not in the kindred genera *Micropeplus* and *Anthophagus*. Upon examining the former genus, I find, that although *Omalium planum* and affinities, *O. Striatulum*, and some others, appear not to have them, yet with the aid of a good magnifier they may be discovered in most species of that genus, as likewise in *Evæsthotus*. I find them also very conspicuous in *A. Caraboides* and other *Anthophagi*, but some species appear to want them.—Kirby.

On a prétendu que les *Anthophagus*, les *Omalium* et les *Paussus* avaient des yeux simples; mais j'avoue que je n'ai jamais pu les apercevoir.—Struus-Dürckheim.

^c La tête offre six régions principales : le front ; la face ; la région inférieure ; la région postérieure : les yeux forment les deux régions laterales. 1. Le front (*frons*) ou la région frontale, s'étend de la partie postérieure de la tête, à la base des antennes, et d'un œil à l'autre œil. Il se divise en trois parties. La partie la plus postérieure, et celle qui ordinairement a le moins d'étendue est située derrière les stemmâtes, et porte le nom de vertex (*vertex*). La partie stemmatique, ou les stemmâtes (*stemmata*), placée entre le vertex et le vrai front, consiste en un petite pièce ordinairement demi-circulaire, où les yeux lisses sont implantés. Le front, le vrai front (*frons*) s'étend d'un œil à l'autre et de la région

Straus-Dürckheim's description of the skull of a cockchafer is beautifully simple; and the only one yet pub-

stemmatique à la base des antennes. Il offre sur son milieu deux pièces ordinairement adossées et colorées assez régulières : ce sont les frontaux (*frontalia*.) A la partie antérieure du front, dans un triangle plus ou moins prononcé, vers l'origine des frontaux, on remarque deux pièces plus ou moins développées, et qui parviennent même à séparer les frontaux, et à s'intercaler entre eux dans toute leur longueur : ce sont les inter-frontaux (*interfrontalia*.) Les parties latérales du front sont formées, ainsi que je le dirai, par le prolongement des optiques. La région frontale est ordinairement plus développée sur les femelles que sur les mâles. 2. La face (*facies*) est la région qui s'étend plus ou moins verticalement de la base des antennes à l'épistome et transversalement d'un œil à l'autre œil; c'est à tort que les entomologistes Allemands la nomment hypostome (*hypostoma*). Cette région se compose de diverses parties distinctes qui méritent d'être spécialement caractérisées. La portion médiane offre deux fossettes (*foveæ*) verticales ou obliques, qui servent de support aux antennes dans le repos : ces fossettes, faites de deux pièces souvent très distinctes, forment quelquefois une cloison par l'adossement de leur côtés internes; alors elles émettent une petite crête, plus ou moins aiguë à leur point de jonction. Le long du côté externe de chaque fossette s'étend une pièce, plus ou moins développée, plus ou moins cili-gères, qui part de la base des antennes, longe le bord de la face, prend un peu plus de volume vers son angle antérieur, et porte un gros cil avec une sorte de moustache, due à d'autres cils moins forts. Ces deux pièces qui portent le nom de faciaux (*facialia*) sont souvent cili-gères le long des bords du péristome. Les médianes (*mediana*) sont des pièces ordinairement triangulaires, souvent un peu colorées, et susceptibles d'acquies un certain développement, qu'on remarque entre les faciaux et les pièces du pourtour de l'œil un peu au-dessus des pièces latérales du péristome; ils ne montent jamais jusqu'à la base des antennes. Je nomme optiques (*optica*) les pièces plus ou moins bombées, qui entourent l'œil sur la face, montent jusqu'à la base des antennes, s'étendent jusqu'au vertex, et jusque derrière l'œil. Souvent ils forment vers les antennes la crête aiguë ou l'angle qui sépare le front d'avec la face. Ils sont ordinairement piligères surtout à la région frontale; plusieurs observations tendent à me faire croire que, vers l'angle frontal, ces pièces optiques sont manifestement séparées. Si ce fait vient à se confirmer, on aura les optiques frontaux (*optica frontis*) et les optiques de la face (*optica faciei*.) Ces optiques correspondent à une portion des joues (*genæ*) des auteurs. 3. La région inférieure située entre la face et la région postérieure, offre un cavité où la base de la trompe et la plupart de ses muscles prennent leur attache, et où la trompe se retirée ordinairement pendant le repos. Cette cavité que je nomme péristome (*peristoma*) est formée de deux pièces latérales qui se soudent en avant et en arrière. J'appelle épistome (*epistoma*) son bord antérieur, qui en haut se soude avec les fossettes et se développe souvent en bec. Cet épistome affecte diverses formes qu'il importe beaucoup de remarquer : sur quelques genres, il est manifestement formée par deux pièces. Les faciaux longent latéralement les pièces du péristome et souvent ils y sont ciliés. Les lateraux (*lateralia*) sont de deux pièces ordinairement assez développées et faciles à distinguer, que l'on voit sur les côtés inférieurs du péristome. Ils s'étendent sur les médians, et s'avancent jusque sous la partie un peu postérieure des yeux. Dans plusieurs genres on voit, sous l'épistome une petite pièce semicirculaire, solide est bien détachée, qui recouvre la base antérieure de la trompe : c'est le chaperon (*clypeus*) des autres insectes. 4. La région postérieure, évidemment

lished that is *generally* applicable.^d It will be of small service to name, with the greatest nicety, the parts visible in one genus or family. With exquisite talent Savigny has remarked, that naturalists multiply facts to admiration, but invariably decline generalizing them.^e It is this generalizing, this universal application, that we stand in need of. We want a nomenclature that can be applied to all.

The only portion of the skull to which any general names can be attached, are these:—the *Epicranium*, or upper portion of the skull, of which the *Clypeus* or *shield*, and *Ocelli* or *simple eyes*, are constituent parts; the *Gula* or *throat*, which is the under portion of the skull, of which the *Mentum* or *chin*, is a constituent part;^f and the *Oculi* or *eyes*, which are the lateral portions. The *neck*, of various authors, as applied to a part of the head, is nothing more than an elongation of the

composée de deux pièces larges, inférieures, et laterales, se trouve en contact avec la face antérieure du prothorax. Elle est percée d'un trou pour le passage des nerfs, des trachées et du tube digestif. A sa partie supérieure, entre les yeux, et au-dessus de ce trou, on doit distinguer le cérébral (*cerebrale*) ou la pièce qui fait suite au vertex et qui recouvre le cerveau. 5 et 6. Les yeux à réseau, ou les grands yeux forment les régions latérales de la tête. Ils offrent rarement quelque chose de remarquable et sont toujours entourés dans leur circonférence par les optiques, un peu moins développées en arrière qu'en devant.—*Desvoidy*.

^d Le crâne du *Melolontha* est composé de six pièces soudées entre elles, et qui je nomme la pièce Epicranienne, ou simplement l'Epicrâne, le Chaperon, la Basilaire, la Prébasilaire, et les deux Cornées des yeux. 1. La pièce Epicranienne comprend la majeure parti de la tête, dont elle occupe principalement la région supérieure. 2. La Chaperon est une seconde pièce impaire de la tête, placée transversalement au devant du bord antero-supérieur de l'épicrâne, avec lequel elle se soude, et dont elle fait la continuation. 3. La pièce Basilaire, également impaire, occupe la partie inférieure et postérieure de la tête: sur les côtés, elle s'unit par suture avec l'épicrâne. 4. Je donne le nom de Prébasilaire à une quatrième pièce impaire du crâne, placée au-devant de la basilaire dont elle fait la continuation. 5 et 6. Les Cornées des yeux forment les seules pièces paires qui entrent dans la composition du crâne: ce sont deux calottes ovales, convexes, enchassées dans les deux grandes ouvertures latérales de l'épicrâne.—*Straus-Dürckheim*.

^e Les entomologistes multipliaient à l'envi les observations; mais ils se dispensent de les généraliser; ils créaient chaque jour des genres nouveaux, et les premiers fondemens de cet édifice auquel ils travaillaient avec tant d'ardeur n'existaient point.—*Savigny*.

^f It will be seen by a reference to Latreille's last work, *Cours d'Entomologie*, that he finally decides the *mentum* to be a portion of the skull, and not of the lip; in fact, he declares that the part he means is the *prébasilaire* of *Straus-Dürckheim*. See *Cours d'Entomologie*, p. 204. Le menton ou ganache n'est que prolongement de cet espace inférieur et gulaire de la tête que M. Straus nomme *pièce prébasilaire*.—*Latreille*.

skull posteriorly.^g If description requires more definite limits, parts may be intelligibly designated by their propinquity to other parts. The shield is that part of the skull which is immediately above the mouth, and whose office is to shield it from injury. It was considered by Fabricius a part of the mouth. It is described by him as a corneous porrected part of the head, covering the mouth above, horizontally. It is divided by him into two parts, the *disk* and the *limb*: the limb is the upper lip, the disk is the true shield.^h It is called by Straus-Drückheim, &c., *chaperon*; by Kirby, *nose*. In *Lepidoptera*, the shield is little apparent; it is hidden by the scales. In *Diptera*, it is more readily distinguished. In *Hymenoptera*, it is very distinct; you will recognize it, in the large corneous piece embraced by the lower portion of the eyes in the hornet.ⁱ In *Coleoptera*, it is sometimes obscure, as in *Hydrous*;^k sometimes very conspicuous, as in *Copris*. In *Orthoptera*, it is always distinct. In several orders of this class, the suture, uniting the shield with the upper part of the skull, is membranaceous; hence the lip and shield move simultaneously with the mandibles in mastication. This is a departure from a general law of nature, and its occurrence is well worth remarking; as the motion of the shield might induce an observer to suppose it the lip, which would consequently become a new and supernumerary elementary part.^l In *Hemiptera*, it is frequently raised and conspicuous, but its limits are indistinct. In the central group, the dragon-flies, it is raised, conspicuous, distinct, and horizontally divided into two.^m The *Epicranium* is the whole upper region of the skull, bounded in front by the shield when distinct; laterally, by the eyes; and behind, by the junction of the head with the *prothorax*. Its extent is greatest in *Coleoptera*;ⁿ least, in *Diptera* and *Neuroptera*.^o The *Oculi*, or *eyes*, are large lateral portions of the skull, known to every one. The *Ocelli*, or *simple eyes*, are small, highly convex lenses, soldered into

^g *Necrophorus*. Head, with a distinct neck.—*Stephens*.

^h *Clypeus*. Horizontalis capitis pars cornea porrecta os superne tegens. a. discus b. limbus.—*Fabricius*.

ⁱ Plate V. fig. 16. æ.

^k Plate V. fig. 1, and 3. æ.

^l Je suis convaincue lorsqu'on aura mieux examiné la bouche des insectes, proprement dits, on trouvera quelle forme qu'elle affecte elle est toujours essentiellement composée des mêmes élémens.—*Savigny*.

^m Plate V. fig. 15. æ. æ.

ⁿ Fig. 3. Æ.

^o Fig. 15. Æ.

the top or crown of the skull. The *Gula*, or *throat*, is the portion immediately below the under lip, and extends to the union of the head with the *prothorax*. The fore-part of the throat is sometimes called the *mentum*, but has no fixed limit. The *mentum* of MacLeay is the *labium* of Fabricius.

The parts of the skull are these: the crown, the two eyes, the throat. These are the four divisions of a section.

I would propose these names for the—

FIXED PARTS OF THE HEAD.^P

- (Æ) EPICRANIUM, or *upper part of the skull*.
- (æ) CLYPEUS, or *shield of the mouth*.
- (œ) OCELLI, or *simple eyes*.
- (Æ) GULA, or *throat*.
- (œ) MENTUM, or *chin*.
- (Œ) OCULI, or *eyes*.

MOVEABLE PARTS OF THE HEAD.

- (y) ANTENNÆ, or *cranial feelers*.
- (j) OS, or *mouth*.

As before observed, the great development of one part necessarily requires the proportionate diminution of another part. A part increases or decreases in volume precisely as the organs it may bear require muscle for their guidance and government; on the (acknowledged) plan, that, for so much muscular exertion so much muscle must be provided, which muscle must occupy so much space. This is well illustrated by the head of insects. Professor Sang has prettily observed, that every instrument, whether it be for the generation or transference of power, has a best size and a best form. Nature, in the formation of her instruments, has always adopted that best size and best form. If her creatures wanted but to see, a globular eye floating in space might perhaps be the uniform character of the animal world. If to see and to eat, an eye and a mouth would be given. If to move swiftly in the air were desirable, wings must be supplied; if, on the earth, legs must be added; if in the water, fins. To carry all these organs,

^P In this table the parts marked with small diphthongs are variable and inconstant; those with capital diphthongs are constant throughout the classes. The diphthongs and letters refer to figures in Plate V.

Fig. 1.



Fig. 2.

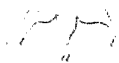


Fig. 3.



Fig. 4.

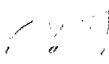


Fig. 5.

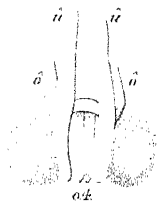


Fig. 6.

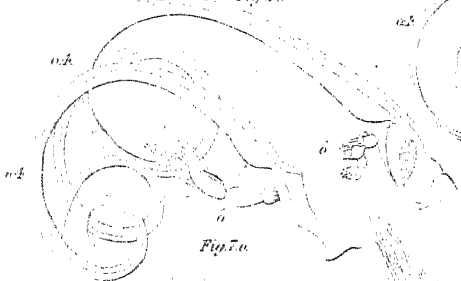


Fig. 8.

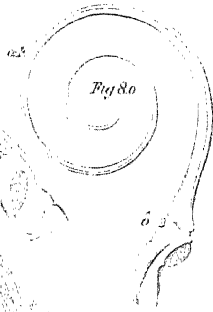


Fig. 7.

Fig. 10.

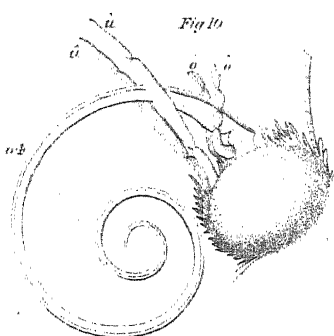


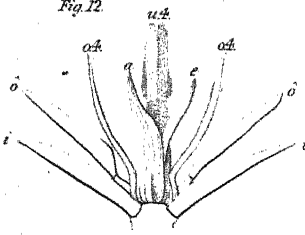
Fig. 9.



Fig. 11.



Fig. 12.



and to contain muscle to guide and govern them, a body must be added. Each part of the body will be of best size, and best form, for the functions it has to perform. We have seen that insects, in the *larva* state, have a very uniform allowance of muscle to each segment. In the *imago*, the charge of supporting the whole body in the air is entrusted sometimes to a single segment; and, in order to supply sufficient strength for the purpose, nature robs the neighbouring segments of their muscle, and gives it the one which needs it. In the head, the mouth, feelers and eyes operate, in the same manner, one on another. Observe the dragon fly, the emperor of his tribe:^a his wings rustle as he hovers stationary and hawk-like in the air; his appetite is insatiable; his food, the active occupants of his own element,—it is given to him in charge to set bounds to the increase of the insect race; he beholds his prey afar off; he darts on it with the rapidity of a lightning-flash. To devour it, ere life is departed, is the work of an instant. He sails round and round; he soars up and up. When the sky is serene he seeks his prey, like the swallows, almost beyond the reach of human sight. What organs does such an animal require? Are they not these; eyes, mouth, and wings? How has Nature provided for his wants? Regard his head: below, it is all mouth; above, it is one continuous eye. Contemplate his wings: their character is strength and lightness, power and activity. His body is slender and graceful; like a rudder, it serves as an instrument wherewith to shape his course. Porrected feelers, whether cranial, labial, or maxillary, would be comparatively useless to an animal whose dependence for support is on the keenness of its vision and the velocity of its flight. We find them but little prominent; his every organ of the required size. The same law obtains as certainly and unvaryingly in form. There is truly a best size and a best form, and nature always provides it.

The fixed organs of the head, manifesting but slight variations, require no further comment. The *antennæ* or cranial feelers, and the mouth, are the only moveable organs. The *antennæ* are too well known to dilate on. The mouth must be considered more at large. The union of the head with the *prothorax* is by an articulation much more free than that between either of the following

^a Genus *Anax* of Leach.

segments. Its power of motion is principally dependent on its relative size as regards the *prothorax*; sometimes it greatly exceeds that segment in size, and it is then loosely suspended at its extremity; sometimes it is much less than the *prothorax*, and received almost entirely within it, as a ball in a cup.¹

The mouth of insects is essentially uniform. Its united parts work to the same end by different modes. Nature arrives at her object by the most direct means. Her plans are the perfection of simplicity. It may sometimes appear otherwise to us; that it does so is attributable to our ignorance, not her error. The construction of the mouth is peculiarly simple: even amid all the confused and laboured nomenclature with which descriptions of it have been loaded, its exquisite simplicity renders it intelligible to the meanest capacity. A celebrated lecturer well said, in allusion to the rage of the day for theoretical ideas and metaphorical allusions, "A stomach, gentlemen, is a stomach." In like manner, a mouth is a mouth, not a *proboscis*, nor a *haustellum*, nor a *trunk*, nor an *antlia*, nor a *promuscis*, nor a *tongue*, nor a *rostrum*, nor a *rostrulum*, nor a *rostellum*, but simply a mouth. The terms *haustellate* and *mandibulate*, as applied to the mouth of

¹ Dans les insectes l'articulation de la tête sur le corselet présente deux dispositions principales. Dans l'une les points de contact sont solides, et le mouvement est subordonné à la configuration des parties; dans l'autre l'articulation est ligamenteuse: la tête et le thorax sont réunis par des membranes. L'articulation de la tête, par le contact des parties solides, se fait de quatre manières différentes: 1. Où la tête porte, à sa partie postérieure, un ou deux tubercules lissés, que reçoivent des cavités correspondantes, dans la partie antérieure du corselet (*Scarabæus*, *Lucanus*, *Cerambyx*, &c.), dans ce premier cas la tête est mobile d'avant en arrière: 2. Où la partie postérieure est absolument arrondie, et tourne sur son axe, dans une fossette correspondante, de la partie antérieure du thorax (*Curculio*, *Brentus*, &c.), la tête se meut en tous sens: 3. Où la tête est tronquée postérieurement, et présentant une surface plate, et articulée tantôt sur un tubercule du thorax, tantôt sur une surface aplatie et correspondante (presque tous les Hyménoptères et plusieurs Diptères, *Tabanus*, *Musca*, *Syrphus*, &c.) 4. Enfin, où, comme dans quelques espèces d'*Atelabes*, la tête se renverse en arrière par un tubercule arrondi, reçu dans une cavité correspondante du thorax; le bord de cette cavité est échancré et ne permet le mouvement de la tête que dans un seul sens. Il n'y a guère que dans les insectes Orthoptères, et dans quelques Neuroptères qu'on remarque l'articulation ligamenteuse: la tête, dans cette disposition articulaire, n'est gênée que dans ses mouvements vers le dos, par qu'elle est retenue par une avance du thorax, mais au-dessous elle est absolument libre. Les membranes ou les ligamens s'étendent du pourtour du trou occipital à celui de la partie antérieure du corselet, ce qui donne une grande étendue aux mouvemens.—Cuvier.

insects, are unavailable as distinctive characters. To Clairville has been assigned the merit of distinguishing between these supposed different kinds of mouth. He does not deserve it. Aristotle remarks, that some insects possessed teeth for devouring every thing, whilst others had only a tongue for sucking liquids.^s Fabricius was well aware of the distinction; he placed together the four classes, *Coleoptera*, *Orthoptera*, *Neuroptera*, and *Hymenoptera*; and in a separate group, *Lepidoptera*, *Hemiptera*, and *Diptera*.^t Lamarck applied the distinction to divisions. Clairville named those divisions. Savigny investigated more thoroughly, and proved the difference to be rather apparent than real. Aristotle's was the observation of a true naturalist; that of Fabricius no less so; Lamarck's was the application of a systematist; Clairville's the clever and apt idea of a nomenclaturist; Savigny's the discovery of a philosopher. I have not happened to meet with, in print, a distinctive character by which these supposed groups can be separated. It is a dichotomous one. Like all dichotomies, it consists of a positive and a negative. It is this:—in the mandibulate classes the mandibles *do*, in the haustellate classes the mandibles *do not*, move horizontally. It has no reference to the possession of mandibles: all insects possess mandibles. The food can never reach the *œsophagus* without passing through an intermediate space. Its passage through this space is by suction; the space is called the *haustellum*. The butterfly and the beetle alike possess this *haustellum*; it varies only in length. Any difficulty in obtaining food, which the bulk of the head and body may occasion, is provided for by nature by an elongation of this *haustellum*. When, combined with this difficulty, the food is solid, the mouth is placed at the extremity of this *haustellum*, as in weevils. When the food is liquid, the parts of the mouth itself are elongated, and, united, form the *haustellum*, as in bees and butterflies. The caterpillar eats solid substances; its mouth is necessarily hard for their mastication: the bulk of its head and body offer no obstruction to its obtaining an ample supply of food; the passage to the *œsophagus* is short. The butterfly subsists on

^s Τῶν δ' ἐντόμων τὰ μὲν ἔχοντα ὀδόντας, πανφάγα ἐστί· τὰ δὲ γλώτταν μόνον τοῖς ὑγροῖς τρέφεται, πάντοθεν ἐκχυλίζοντα ταύτη. Aristotle.

^t This appears to have been the first division of this kind that is at all clearly defined.

fluids; its mouth requires no hardness; the bulk of its head and body offers an obstruction to its obtaining a sufficient supply of its food, which is generally concealed in the nectary of flowers; the passage to the *oesophagus* is lengthened, and the difficulty overcome. The caterpillar produces the butterfly; one is haustellate, the other mandibulate: they cannot be placed in separate classes. The mouth sometimes varies as much and as abruptly in the same insect in its different stages, as in any two different insects in their final stage. In others it remains nearly the same, or gradually approaches its perfection with every change of skin. In *Orthoptera* and *Hemiptera* the latter is the case: in these classes, every *ecdysis* is a *metamorphosis*; the food and economy undergo no change, the organs therefore require none. Nature never provides uselessly. Fabricius beautifully observes, that it is the part of the wise man to study these things; to observe, record, and add them to the stores of science; to weigh well the mysteries of Nature, and trace the hand of a Creator in the wonders of his creatures. Lamarck says, that each peculiar form has been acquired by degrees,^u and by striving to attain a particular object.* He appears to have forgotten, that if honey had been denied to the bee until its little mouth had lengthened out into a thread-like tube, starvation and extinction of its race must have been the consequence. Kirby, in reference to this, exclaims, It is grievous that this eminent zoologist, who in other respects stands at the head of his

^u La nature, dans toutes ses opérations, ne pouvant procéder que graduellement, n'a pu produire tous les animaux à-la-fois : elle n'a d'abord formé que les plus simples; et passant de ceux-ci jusqu'au plus composés, elle a établi successivement en eux différens systèmes d'organes particuliers, les a multipliés, en a augmenté de plus en plus l'énergie, et, les cumulant dans les plus parfaits, elle a fait exister tous les animaux connus avec l'organisation et les facultés que nous leur observons.—*Lamarck. An. sans Vert.*

* Premièrement, quantité de faits connus prouvent que l'emploi soutenu d'un organe concourt à son développement, le fortifie, et l'agrandit même; tandis qu'un défaut d'emploi, devenu habituel à l'égard d'un organe, nuit à ses développemens, le détériore, le réduit graduellement, et finit par le faire disparaître, si ce défaut d'emploi subsiste, pendant une longue durée, dans tous les individus qui se succèdent par la génération. On conçoit de là qu'un changement de circonstances forçant les individus d'une race d'animaux à changer leur habitudes, les organes moins employés dépérissent peu à peu, tandis que ceux qui le sont davantage, se développent mieux et acquièrent une vigueur et des dimensions proportionnelles à l'emploi que ces individus en font habituellement.—*Lamarck. Phil. Zool.*

science, should patronize notions so evidently absurd and childish. Cuvier wisely remarks, that there is no proof that the differences which at the present day distinguish animals from each other can have been produced by circumstances.

Thirty years ago, in this country, we were so bound by the fetters of the Linnæan system, that the mouth of insects was never resorted to as likely to afford distinctive characters. Our great writers in their generic descriptions make no allusion to it. Marsham's^y *Coleoptera*, and Haworth's^z *Lepidoptera*, at this day the only continuous descriptive lists of the species of whole classes that we possess, are dependent for their principal characters on the antennæ alone. At the present time it is far otherwise. The value of the mouth, in furnishing characters, is well known: its anatomy, therefore, cannot be a matter devoid of interest.

The mouth of insects I have already traced to three sections; the lips, the maxillæ, and the mandibles. I am now about to consider it in another light, as consisting of seven primary parts, as under;—

- No. 1. (a) LABRUM, or *upper-lip*, bearing inferiorly the (â) EPIPHARYNX, or *valve*.
2. (u) LABIUM, or *lower-lip*, bearing the (â) LABIPALPI, or *labial-feelers*, and, moreover, divided into:—
- (u 1.) INSERTIO, or *insertion*, (*stipes* of MacLeay).
 - (u 2.) LABIUM, or *true lip*, (*mentum* of MacLeay).
 - (u 3.) PALPIGER, or *feeler-bearer*.
 - (u 4.) LIGULA, or *limb*, (*labium* of MacLeay).
- 3 & 4. (i) MANDIBULÆ, or *mandibles*.
- 5 & 6. (o) MAXILLÆ, or *feeler-jaws*, bearing the (ô) MAXIPALPI, or *maxillary-feeler*, and the (û) GALEA, or *helmet*, and divided into:—
- (o 1.) INSERTIO, or *insertion*.
 - (o 2.) MAXILLA, or *true feeler-jaw*,
 - (o 3.) PALPIFER, or *maxillary feeler-bearer*
- } united, the *stipes* of Kirby.
- (o 4.) LACINIA, or *blade*.
7. (e) LINGUA, or *tongue*, (*hypopharynx* of Savigny).

The whole of these parts are not equally developed. The

^y *Scarabæus*. Antennæ clavatæ, capitulo fissili.—Marsham.

^z *Papilio*. Antennæ versus apicem clavato-capitatæ, in sectione ultima plus minusve uncinatæ.—Haworth.

mode of their development affords characters by which classes are distinguished; the degree of their development, and the variation of their form, those for subordinate divisions. The diminution of a part until it escapes our notice is no proof of its non-existence; otherwise, the discovery of a part by a highly-magnifying power might be termed its creation. In the foregoing table, it will be seen that there are some parts originating in, and totally dependent on, the others. These are the feelers and *galea*; which may be termed secondary parts. Now secondary parts cannot exist without the primary parts which bear them. The presence of labial-feelers ensures a *labium*; the presence of maxillary-feelers ensures a *maxilla*. I feel considerable hesitation in considering the tongue, or *hypopharynx* of Savigny, a primary part. It is, however, of little moment what nominal value we may set on it. Its importance is precisely that of the tongue in the human mouth. It originates at the *pharynx* in common with the two lips, and is a portion of the same section.

The situation of the mouth is commonly in the lower part of the head, a little forward, calculated for feeding readily while the head is naturally inclined; it is bounded above by that part of the skull called the *clypeus*, and below by that part termed the *mentum*, from both of which it is perfectly distinct. I will now endeavour to trace the variations of its parts.

The first part of the mouth is the *LABRUM*, or *upper lip*. Fabricius, in describing this part, is very inaccurate. He has confounded it with the *clypeus*. He describes its variations in different genera. He alludes in one genus to the *clypeus*, in another to the *labrum*; in a third he unites the two. You will remark, it is never sutured to the skull; it is always free, moveable, and distinct. It unites with the lower-lip, and forms with it a distinct section. It bears on its under side the *Epipharynx*. It is usually an osseous piece, freely articulated to the *clypeus*, and originating below and within it. It is of variable shape; never palpigerous; and it serves as a cover to the other parts of the mouth. In *Lepidoptera*, the upper-lip is an unimportant part, and appears to have escaped the notice of naturalists, until detected by the accurate Savigny.^a It is a thin flat scale-

^a On voit d'abord que la lèvre supérieure doit être très petite et très peu apparente; elle est mince, membraneuse, quelquefois demicirculaire, mais le plus

like piece, projecting but little beyond the *clypeus*. It is generally pointed; and its under surface or *epipharynx* is formed to fit exactly the aperture at the base of the feeler-jaws. It has thus partially the power of a piston, and assists in drawing fluids through the tube formed by the united feeler-jaws. In *Diptera*, the parts of the mouth are generally very obscure; but when a peculiar mode of feeding requires active exercise, you will find they are called into very obvious existence, and each becomes fully developed. The *Diptera*, like the *Lepidoptera*, live principally by suction; but unlike them, have frequently to pierce the cuticle of the object, the juices of which they seek to extract. This operation calls into action organs which were dormant in the honey-sucking butterflies. The blood-suckers among *Diptera* offer the best examples of a developed mouth. The upper-lip is large, long and sharp-pointed in *Tabanus*.^b In *Culex*, it is longer still, and more slender. If equal development of the primary parts constitutes perfection in the mouth of insects, then *Tabanus* and *Culex* may be said to possess perfect mouths. In these the primary parts are equally developed. In *Sphæromias*, and other nearly allied genera, you will find the upper-lip deeply grooved beneath, and partially receiving the other organs, as in *Hemiptera*. In *Rhyphus*, it has a tendency to the same form. In the *Asilites*, it is plain, stiff, and but half the length of the other organs. In the *Empites* it is long, and forms the outer cover of the beak of these insects. In *Medeterus*, if I have not mistaken, it is palmate; the central lobe being longest, the next to it next in length, and the external ones shortest. In *Æstrus*, the *labrum* and whole mouth have disappeared. Clark, in his valuable Essay on the Bots of Horses, speaks of the mouth of *Æstrus* as a simple aperture;^c thus implying the existence of a *pharynx*; I confess I have not found it. Desvoidy appears to have a new theory regarding the mouths of *Diptera*. If it prove correct, nearly all the received nomenclature must fall.^d In *Hymenoptera* the upper-lip is short,

souvent allongée en pointe, appliquée contre la base de la trompe et reçue dans la suture moyenne de manière à fermer exactement le léger écartement qui se trouve entre ses deux filets.—*Savigny*.

^b In Plate VI. is represented the mouth of *Tabanus bovinus*.

^c Os, apertura simplex, neque ullo modo exertum.—*Clark*.

^d La trompe (proboscis) des Diptères, selon moi, n'est point formée par la

solid, bony, and somewhat quadrate. Unlike the same part in *Diptera*, it cannot be bent without injury. It either retains the bend or it breaks. It is not always visible externally. In the bee it is conspicuous: in the wasp it is hidden by the *clypeus*. In *Coleoptera* it retains a similar character. It varies much in development. The *Scarabæites* have the upper-lip small. I cannot consider, with Olivier, that it is in any case absolutely wanting,^e although the great stag-beetle is almost without it. In these orders^f the *clypeus* supplies its place: whence the error of Fabricius in confounding the two. In the rapacious beetles it is large. In *Anthia* and *Cicindela* it is very conspicuous. In all water-beetles it is fully developed; the difference in their economy does not affect it.^g In *Orthoptera* its character continues the same, its relative size larger. In *Hemiptera* it has changed. It continues rigid, and is injured by bending: but it is longer and more pointed than in the three preceding classes. It is grooved to receive the *labium*, and is the only part of the mouth that is detached. In *Issus* it is sharper than a needle. In the other *Cicadites* it is more obtuse. In the *Cimicites*, again, it is sharp; and the same in the *Nepites*. The mouth in *Neuroptera* has no common character. Neuropterous orders, with the exception of the central one, *Libellulites*,^h assimilate in all their characters to the classes to which they approach. I cannot, therefore, detail

lèvre inférieure, comme celle des Hyménoptères, mais par les mâchoires. Dans les *Myodaires*, elle est ordinairement membraneuse, quelquefois solides et triarticulée. La base est enveloppée par la base de la lèvre inférieure, dont les deux palpes sont toujours développées, et qui se prolonge en deux supports latéraux et ordinairement solides. Le corps de la trompe se prolonge en une gaine, terminée par des lèvres membraneuses dues à des trachées très développées, et par des palpes qui peuvent être solides. Elle renferme deux filets allongés qui forment le sucoir et qui représentent les mandibules. La pièce plus ou moins solides qui se prolonge sur la rainure de la trompe est le labre ou la lèvre supérieure.—*Desvoidy*.

^e Les *Scarabées* qui ont des mandibules, et qui n'ont point de lèvre supérieure.—*Olivier*.

^f *Scarabæites* and *Lucanites*.

^g In water beetles the *clypeus* is never distinct.

^h La labre demi-circulaire voutée; deux mandibules écailleuses, très fortes et très dentées; des mâchoires terminées par une pièce de la même consistance, dentée, épineuse et ciliée au côté intérieur, avec une palpe d'un seul article, appliqué sur le dos, et imitant la galète des Orthoptères, une lèvre grande, voutée, à trois feuillets, et dont les latéraux sont des palpes; une sorte d'épiglotte ou de langue vésiculaire et longitudinale dans l'intérieur de leur bouche.—*Latreille*.

their peculiarities. To describe a single order would be merely to mislead; to describe all would be extending my letter to an unreasonable length.

The LABIUM or lower lip corresponds with the upper lip. It occupies the same situation below the jaws that the upper lip holds above them. The upper and lower lips therefore close the mouth vertically. There is no part of the mouth concerning which writers are so little agreed as this. The difficulty has arisen in two ways;—first, from the number of its parts; secondly, from the propinquity of similar parts. The lower lip is a compound and somewhat complicated organ. Every one has seen this; and every one has been desirous of applying some name to each of its parts. The next organ above it is the *tongue*; the next part below it is the *mentum*. It is not much to be wondered at that entomologists finding these three names—finding three very distinct parts in the lip—and moreover, very frequently finding no distinct tongue or *mentum*, should have applied the three names, *tongue*, *lip*, and *mentum* to the three most conspicuous and manifest divisions of the lip. The name *mentum* was given by Réaumur. Now the names of Réaumur impose no law: did they, half our present nomenclature must be abandoned. Latreille has, however, decided on retaining the name, and has applied it to the part of the throat immediately adjoining the mouth. The lower lip is divisible into four portions:—the *Insertio* or *insertion*; the *Labium* of Fabricius, or *true lip*; the *Palpiger* or *feeler-bearer*; and the *Ligula* of Fabricius, or *limb*. Of these, the *palpiger* appears to be now noticed for the first time. The *insertion* is precisely what the name implies; it is, in fact, the root by which the lip holds. It is always, in a greater or less degree, concealed by the *mentum*. Savigny has called it *support* and *insertion*. MacLeay, it will be seen, has named it *stipes*;—a name not inapplicable to the particular instances in which he figures it. The true *labium* is the second part: it is thus named by Fabricius, and has since been erroneously termed the *mentum* by most modern entomologists. The *palpiger*, or feeler-bearer, is situated above the disk, and is very often confounded with it. It seems generally to be a mere fleshy fold, between the lip and the *ligula*, but is occasionally thrust out far beyond the lip, and assumes the appearance of a *ligula*. In these instances it is easily detected by the feelers which it bears on its summit.

The feeler-bearer is seldom elongated without a similar elongation of the *ligula*. The *ligula*, or limb, is the fourth and terminal portion of the lip; its names have been most numerous. Its variations in form are very striking, and afford excellent generic characters. The two lips are united at their base. The nearer we can approach to a perfect tetrapterous hexapod, the more clearly will this be demonstrated. The type¹ of a tetrapterous hexapod we may yet be unacquainted with. Such a type must exhibit each organ fully developed. Our large dragon-flies are the nearest approach we know of to full and equal development of principal primary organs; in these we clearly perceive that the two lips are but a single piece, of which the central portion is flexible and fleshy, and perforated by a circular aperture, known as the *pharynx*. Let us now trace the variations of the lower lip.

In *Lepidoptera*, the lower lip is usually a triangular piece, the base of which is closely united to the inferior region of the skull.^k Its surface is uniform, and its divisions obscure. Its apex is generally acute, and terminated by a single point: yet sometimes, as in *Amaryssus*,^l it is bidentate. The labial-feelers arise from it in nearly an erect position, one on each side of the feeler-jaws, which form a small ring between them. Although obscure, the divisions of the lip are manifest under a good glass. The genus *Ino*, of Leach, exhibits very evident lines across it, which show with sufficient accuracy the limits of each division. The margin of the *insertion* rises to a level with the anterior margin of the *mentum*. The *labium* is a narrow arcuate piece, situated above this, and bordering the insertion of the feelers. The *feeler-bearer* is another narrow piece, whose margins, centrally, are nearly connate, laterally dilated for the reception of the feeler. The *ligula* is very considerably larger than the other divisions of the lip: it is triangular, with a very acute apex. The *feelers* in this genus, as figured by Savigny, exhibit a basal joint, in addition

¹ By the word *type* I would imply the perfection of a peculiar kind. Hexapods, approaching spiders, or *Ametobola*, for instance, would be departures from types.

^k Je dirai peu de choses de la lèvre inférieure: elle consiste en un simple plaque triangulaire, ordinairement écaillée, unie par une membrane aux deux tiges des mâchoires, et supportant à sa base les deux palpes que tout le monde connaît.—*Savigny*.

^l *Papilio Machaon*.—*Lin.*

to the two usually described. The apex of the *ligula*, and the form of the articulations of the feeler, seem to be the only portions of the lip in this class that are likely to be available for generic distinctions.

In *Diptera*, the lower lip is the largest and most conspicuous portion of the mouth. It is the organ known to every one, with which the busy house-fly attacks our sweets. It is not unfrequently termed the *proboscis* of the fly, a term, however, applied by Meigen to the united mouth of *Culex*.^m Desvoidy, as already stated, has another idea about the anatomy of this organ. The *ligula* of *Hymenoptera*, shortly to be noticed, appears to have a precise analogue in the incrassated bilobed termination of the lip of *Diptera*. Immediately below this, in the genus *Tabanus* and some neighbouring groups, may be seen on each side of the lip a pilose excrescence. Savigny considers this the labial-feeler. It is the very situation in which analogy will lead us to look for this organ; and the idea that it is such is, consequently, far from improbable. I have, with great pains, sought for some character, whereby I might with confidence confirm Savigny's opinion, but have been unsuccessful: there appears no trace of articulation. By a careful examination, and frequently turning the object in the light while the eye is fixed on it, a nearly direct line will be seen crossing the lip immediately below these excrescences, thus separating, as I conjecture, the feeler-bearer from the true *labium*. The *insertion* is distinct; it has been noticed and figured by Savigny and others. The divisions of the lip are more prominent in *Empis*, *Stomyxis*, *Rhlingia*, &c. than in *Tabanus*; yet still sufficiently indistinct, and scarcely to be recorded with certainty. The conspicuous presence of four divisions in the lip of *Hymenoptera*, *Coleoptera*, *Orthoptera*, and *Hemiptera*, led me to expect them in *Lepidoptera* and *Diptera*. Let me not influence the judgment of others. I have satisfied myself by patient investigation: I hope my fellow-labourers will do the same. With the exception of the *ligula*, the lip of *Diptera* affords but few characters for generic descriptions.

We now arrive at the *Hymenoptera*. Here the lower lip reaches its maximum. Let us examine the mouth of *Bombus*, the humble-bee. This mouth, if neatly spread out, presents

^m *Culex*. Proboscis porrecta, longitudine thoracis.—Meigen.

us with the branching appearance of a little tree. Let us part off the outer branches, right and left: these branches are the feeler-jaws, to be noticed presently. After the removal of these, we find a long stalk or stem. At its base is a portion, very distinct, of a triangular form, with the apex pointing downwards. To the interior of this triangle the feeler-jaws are very firmly attached, and are with difficulty removed without carrying it with them. From the base of this triangle, which you will recollect is looking upwards, rises the true lip, a long slender piece with nearly parallel sides: near its summit a distinct and tolerably direct line crosses it; this line terminates the true lip: above it is the feeler-bearer. From each side of the feeler-bearer spring the feelers; throughout this order very elongate and conspicuous. From the summit of the feeler-bearer rises the *ligula*,ⁿ trilobed; each lobe is distinct to the very base; the lateral ones are called *paraglossæ*, a name that appears redundant, unless it could be carried through all the orders of this and the two following classes. In *Nomada* the lip is broad, the central lobe of the *ligula* large and moderately long; the lateral lobes small, and very acute. The labial-feelers are distinctly quadriarticulate, and longer than the central lobe of the *ligula*. In *Saropoda* the lip is similar, the feelers indistinctly articulated; and these, together with the central lobe of the *ligula*, much more elongate. In *Bombus* the central lobe of the *ligula* is much longer than the feelers. In *Melecta* the lip is longer than the *ligula*. In *Cælioxys rufescens*^o the *ligula*, in its central lobe, is much shorter than the feelers; its lateral lobes are rudimental. In *Osmia* the central lobe of the *ligula* is nearly three times the length of the lip, and twice the length of the feelers; still the lateral lobes are very minute. In *Anthidium manicatum* the central lobe of the *ligula* and the feelers are exactly of a length; the lateral lobes of the *ligula* are thin, short, and scale-like. In *Andrena*, *Halictus*, *Dasypoda*, *Colletes*, *Hylæus*, and *Sphecodes*,^p the *ligula* is not a quarter of the length of the lip.

ⁿ *Ligula*. This is the part considered by many authors as the lower lip.—*Samouelle*.

^o An insect common in the south of England, but one which I think has not found its way into our British lists.

^p *Sphecodes monilicornis* excepted; which will probably form a new genus, or be removed from this.

In these instances it is quadrifid. Leaving the bees, we shall find the *ligula* in *Odynerus*, *Eumenes*, and *Epipone*, elongate and quadrifid; the feelers also differ essentially from those of the bees, in being situated considerably below the union of the lobes of the *ligula*. The lips of fossorial *Hymenoptera* are shorter than those of the foregoing; the *ligula* is usually short, obtuse, and bifid; the feeler-bearer variously developed, and the feelers much longer in proportion. The *Ichneumonites*, and other parasites, are very similar; the tongue being generally bifid and much shorter than the feelers. Lastly, in the *Tenthredinites*, we find distinctly trilobed *ligulae*, short lip, and long feelers.

In *Coleoptera* the lip is reduced in length, but in all other respects it is very close to that of *Hymenoptera*. Latreille gives the name of *labium* to the whole lower lip in *Coleoptera*. MacLeay calls the same part *mentum*; but, reluctant to relinquish the Fabrician term, *labium*, has applied it to the *ligula*. Kirby^a calls the whole lip, *labium*, but follows MacLeay in the nomenclature of its parts. Curtis, whose beautiful work, entitled "British Entomology," is known to every entomologist in this country, follows the nomenclature^r of MacLeay. The labial feelers of *Coleoptera* are four-jointed. The basal joint is very various in its development. This circumstance is a fruitful source of confusion. The *ligula* originates at or near the *pharynx*. It extends along the inner surface of the lip, to which it is closely attached, and stretches beyond it. The produced portion being in the nomenclature of Fabricius, the limb of the lip, and sometimes the *ligula*, is the only part available for characters. The feeler-bearer in the lip of *Coleoptera* is soft and fleshy, and is remarkable for the variety of its development; and the feelers are attached to it by a loose and flexible articulation. Now, this being the case, you will observe, that the elongation of the *ligula* is very likely to affect the position of organs so situated. Let us examine this. In *Cicindela* the lip has three lobes; the central acute, the lateral ones obtuse. In the spaces between these are situated the feelers; there is no produced feeler-bearer, nor *ligula*. We will next

^a In the *Coleoptera* only I speak of. The *labium* of *Coleoptera* is, in Kirby's nomenclature, the *lingua* of *Hymenoptera*. In *Orthoptera* and *Neuroptera* I am not competent to offer any explanation of this author's nomenclature of these parts.

^r In the majority of the *Coleoptera*. In the other classes there is but little uniformity in the nomenclature of parts.

examine *Cychrus*. The middle lobe of the lip seems to be completely cut away; and the feeler-bearer appears in its place, with a pair of closely-approximating feelers rising from its summit. Turn the other surface of the lip, and apply a good lens: you will find the trilobed *ligula*, minute indeed, but beautifully distinct; the lateral lobes being rather longer than the central lobe, and termed by Latreille *paraglossæ*. *Blethisa* and *Nebria* present a very similar structure, except in the central lobe of the *ligula*, which in these is large and somewhat rounded. In *Helobia* the central lobe has a central tooth. In the *Harpalidæ* and *Scaritidæ*, the *ligula* is generally more produced; and the feeler-bearer and feelers are carried with it. In *Licinus*, the lip and its appendages are similar to those of *Cychrus*. You will find the same similarity in the feeler-jaw and its appendages. In the *Dytiscites* no great difference appears; the lateral lobes of the *ligula* are however mostly obsolete. In the *Hydrophilites* the lip is less indented than in predaceous beetles; the *ligula* is frequently bilobed, and the feelers appear to lose one joint by the second being received into a cup formed by the first. In *Hydroüs*, the feeler-bearer appears obsolete; and the insertion of the feelers behind the lip actually swells out the portions of its margin, behind which it enters. In *Parnus*, supposed to be nearly related to *Hydroüs*, the feeler-bearer and feelers project far beyond the lip. In *Tetratoma*, and *Cis*, the feeler-bearer is raised, but the *ligula* is concealed. In *Leiodes* all the four parts are distinctly developed. In *Trox*, the insertion is peculiarly prominent; and still more remarkably so in *Acanthocerus*.^s In the vast order, *Curculionites*, I find the feeler-bearer very prominent and elongate; yet the *ligula* is mostly obsolete or concealed. In Curtis's figure of *Mono-nychus* there appears to be a distinct *ligula*;—I have never investigated the mouth of this genus. It seems a general character of the order, that the feeler-bearer should be prominent and elongate, the feelers approximate, placed at its summit, and occupying the usual situation of the *ligula*. In the *Cerambycites*, the four parts of the lip are very distinct: in *Saperda*, and *Hematicherus*, particularly so. The remaining

^s Mentum quasi e duplici parte formatum, aliâ apiculi cordatâ ad basin, truncatâ, carinatâ, margine antico emarginato, lateribus rotundatis, elevatis; alterâ prioris stipite transversâ, concavâ, margine antico recto, lineari.—*MacLeay*.

orders of *Coleoptera* exhibit many variations in the parts of this organ, but mostly analogous to those described.

In *Orthoptera*, the lip has the same development as in *Coleoptera*, but the *ligula* is much more produced. It is divided into four lobes, somewhat palpiform. The common cock-roach presents an instance of this. The feelers are four-jointed; the basal joint occasionally amalgamating with the feeler-bearer.

In *Hemiptera* the lower lip wraps itself round the mandibles, &c., forming a sheath for them. It is four-jointed. Savigny considers the basal joint to be the true lip,^t if I comprehend rightly his meaning. Latreille, in his last work, still treats of the lower lip as a quadri-articulate sucker, assigning no names to the articulations. I suppose the four joints to be analogous to the insertion, *labium*, feeler-bearer, and limb, observable in *Hymenoptera*, *Coleoptera*, and *Orthoptera*. Savigny has figured what he considers the feelers of *Hemiptera*, on the part which I have called the feeler-bearer. Willing as I must be to prove the correctness of this idea, I am compelled in fairness to admit that I have never made them out to my own satisfaction. The lower lip in *Hemiptera* varies scarcely at all, except in length. In the Linnæan genus, *Aphis*, several instances occur of its being twice as long as the body, passing beneath it, and projecting beyond it, like a tail.

In the larvæ of the *Libellulites* the lower lip has a most wonderful development, and all its parts are very conspicuous; the insertion is short, but distinct; the labium is long, stout, and incrassated externally; the feeler-bearer is still more developed, in *Æschna*, it is full half an inch in length, and divided into two lobes; the feelers are prehensile and mandibuliform; in fact, much resembling the mandibles of *Cicindela*; the *ligula* is a thin plate spread over the interior surface of the feeler-bearer, and filling up the space which occurs between its lobes. The most remarkable character of this extraordinary lip is its articulation. The *labium* is so freely articulated to the insertion that it is capable of being bent under the body of the insect reaching to the *metacoxæ*. The articulation of the feeler-bearer to the *labium* is of the same kind; while the latter is bent below the insect, the former is directed forwards, and reaches to the front of the mouth;

^t Elle (la lèvre inférieure) est composée de quatre articulations, dont la première représente la ganache des Coléoptères et des Orthoptères.—Savigny.

the two joints thus reposing in parallel lines. The lower lip is the organ with which this ferocious larva seizes its prey. The perfect dragon-fly has also a singular development of the labial feelers: the lip itself is however little different from that of *Lepidoptera*; but the broad mandibuliform feelers are evidently used as organs of prehension and detention of their living prey, as I have often observed on feeding these insatiable creatures with flies whilst holding them by the wings. *Raphidia* displays the three lower parts of the lip in equal development; the *ligula* is concealed behind the feeler-bearer.

Next in order come the MAXILLÆ, or *feeler-jaws*; they are situated in the lower part of the mouth, one on each side, immediately above the lower lip, and below the mandibles, from which they may be instantly distinguished by constantly bearing the *maxipalpi*, or maxillary feelers. This distinction is so evident and unvarying, that I hope I shall be pardoned for applying to them the term, *feeler-jaws*; a term rather uncouth, I admit, yet I think also very distinctive and descriptive. The word *maxillæ* appears to offer no other translation than simply *jaws*, which would not sufficiently distinguish these organs from the mandibles. The feeler-jaws are less liable to variation than any other part of the mouth.^u Their variations are therefore most important. Fabricius, Latreille, MacLeay, &c., have borne testimony to their value in affording distinguishing characters. Each feeler-jaw is divisible into four parts, the *insertio*, *maxilla* or disk, *palpifer*,^v and *lacinia*. Straus-Dürckheim has the merit of first distinguishing these.^x

^u Maxillam constantissimum invenimus, vix in congeneribus aberrat. — Fabricius.

Pièce palpifère of Straus-Dürckheim.

^x Chez les *Melolontha* le corps de la mâchoire est formé de quatre pièces, mobiles les unes sur les autres, mais qui n'ont point encore été décrites. L'une d'entre elles fixe la mâchoire sur la basilare: c'est une pièce à peu près trapezoïde, portant à son petit côté parallèle un condyle articulaire, qui pénètre dans la cavité cotyloïde interne qu'on remarque sur l'apophyse antérieure de la basilare. De ce point d'articulation cette première pièce se porte transversalement en dehors, et va s'unir par son bord opposé aux autres pièces du corps de la mâchoire, d'où je lui donne le nom de *Branche transverse*. — La pièce *Dorsale* des mâchoires est chez tous les coléoptères une plaque presque plane, en triangle isocèle; elle est unie par son petit côté à la branche transverse, et de cette articulation elle se porte en avant et détermine la direction de la partie principale du corps de la mâchoire, dont elle occupe la face externe. Par son bord interne cette seconde pièce s'articule linéairement avec une troisième, placée à la face inférieure de la mâchoire, et que je nomme l'*Intermaxillaire*, et son bord externe

The *insertion* is almost invariably concealed. Savigny has called it also *support*. Kirby, if I understand him rightly, has denominated it the *cardo*, or *hinge*.^y The *disk* and *feeler-bearer* are commonly two pieces running nearly parallel with each other; the former occupying the front, the latter the back of the jaws. It has unfortunately happened, that Straus-Dürckheim has selected for his dissections an insect, in which the situation and proportions of these two parts are very unusual, whence, in different formations, his names appear rather defective. The *palpifer* bears on its back the *maxipalpus*, or maxillary feeler. The fourth part is the *lacinia*, or *blade*. It is called by Savigny, *lâme*; by Straus-Dürckheim, *intermaxillaire*; by Latreille, *internal lobe*; by MacLeay, *lacinia*. It is certainly the *lacinia* of Fabricius, as applied to a butterfly. United to the back of the blade, is the *galea* or *lobe*, a part exceedingly variable; sometimes bearing the appearance of a true feeler, and sometimes being wholly obsolete. It has been called, in the *Carabites*, the internal feeler; in the *Scarabæites*, the outer lobe of the feeler-jaw.^z The name *galea* was given to it by Fabricius. This writer also treated of it as an inner *maxipalpus*. In *Lepidoptera*, the insertion of the feeler-jaws offers nothing

s'articule avec la quatrième, que j'appelle la pièce *Palpifère*. L'*Intermaxillaire* occupe comme nous venons de le dire la face inférieure de la mâchoire, et forme en même temps son bord interne: elle se prolonge peu au-delà de la pièce dorsale, et forme en dessous une large plaque allongée, qui s'étend vers le milieu de son bord interne en une longue apophyse dentiforme, dirigée obliquement en avant et en dedans. L'*intermaxillaire* s'articule en dehors avec la dorsale; à côté de son apophyse, avec l'angle interne de la pièce palpifère; à son bord interne elle est liée par un espèce membraneux avec la galea; enfin, son bord postérieur se continue avec le pharynx. La pièce *Palpifère* occupe la face supérieure de la mâchoire, et se trouve contiguë à la mandibule. C'est une grande plaque, à peu près triangulaire, articulée par son bord externe avec la pièce dorsale; par l'antérieur avec la galea; par l'angle interne avec l'*intermaxillaire*; et enfin son bord postérieur se continue avec le pharynx. Cette pièce forme ainsi avec la dorsale et l'*intermaxillaire* une chambre ouverte, d'une part, du côté de la branche transverse, par où elle communique avec la cavité de la tête, et, d'une autre, avec la galea. Sur l'angle antéro-externe de cette pièce est articulé le palpe, qui forme le principal appendice de la mâchoire.—*Straus-Dürckheim*.

^y At their base they articulate with a piece more or less triangular, which I call the hinge (*cardo*.) This, on its inner side, is often elongated towards the interior of the base of the *labium*, to which it is probably attached. This elongate process of the hinge in *Apis*, *Bombus*, &c., appears a separate articulation: and the two together form an angle upon which the *mentum* sits, and by this the *maxillæ* acts upon the labial apparatus.—*Kirby*.

^z C'est une grosse pièce mobile qui termine la mâchoire.—*Straus-Dürckheim*.

worthy of remark. The disk and feeler-bearer are closely connected, the suture uniting them being obliquely longitudinal. In treating of these parts, I believe it will be better to consider them but as one. Their distinctness is more clearly to be discerned from actual examination of the objects themselves, and from the accurate plates of Straus-Dürckheim, Savigny, &c., than from any verbal description. The blade is long, slender, pliable, and capable of rolling up like an Ionic volute, or the main-spring of a watch. This is a principal character of the class. When at rest, the blade appears to be a small ring, and is situated between the labial feelers. Each blade, when examined, is found to be externally convex, internally concave; so that the two, united together in front, form a tube. Through this tube, the honey of flowers is drawn. Each blade is also in itself a tube. The organ formed by the union of the two is very elastic; and, if artificially drawn out to its full length, will, on being loosed, instantly return to its natural position. The maxillary feelers are by no means a prominent portion in the mouths of *Lepidoptera*. They are situated one on the feeler-bearer of each feeler-jaw. Réaumur, a hundred years ago, noticed the maxillary feelers of *Lepidoptera*,^a and figured them very accurately; but Savigny appears to have been the first scientifically to ascertain their identity. Though not prominent, they afford the best characters for dividing this class that we at present possess. The *galea*, or *helmet*, is still undiscovered. In the *Sphingites* I find no feeler: I conclude, therefore, it is nearly obsolete. In *Zygæna*, *Ino*, *Glaucopis*, *Pyrausta*, and all the *Pyralites* and *Crambites*, it is distinctly visible, generally without a glass, and appears to be typically three-jointed. In the *Tortricites* and *Tineites* the maxillary feelers are less distinct, but always present. In the *Noctuities* they are small and two-jointed. In the *Geometrites* they are still less conspicuous. In the *Papilionites*, less still: in *Amaryssus Machaon*, obsolete.^b

^a Dans la figure on peut remarquer deux barbes plus écartées l'une de l'autre que ne le sont communément celles des autres papillons: deux filets placés entre les barbes, et dirigés dans un sens contraire à celui où les barbes le sont.—Réaumur.

^b Savigny's figure of the maxillary feeler in *Amaryssus Machaon* represents rather the site of the feeler, than the feeler itself. I have hunted for it in vain in the specimens I have dissected.

The blade of the feeler-jaw, in the class *Lepidoptera*, appears to vary only in length.

In *Diptera*, the feeler-jaws are generally of about equal length with the upper lip and mandibles, but are shorter than the lower lip. They are straight, sharp-pointed, and lancet-like. It does not appear that they are generally tubular. The insertion of the feeler-jaws in *Diptera* presents little worthy of notice. The disk and feeler-bearer are two small pieces, placed above each other; from the latter proceeds a feeler with from two to five articulations. The blade is the long sharp-pointed part. The helmet is apparently obsolete. The feeler-jaws fluctuate greatly in their development in the various orders and families of *Diptera*. Curtis, in the work already alluded to, denies their existence in many genera, yet figures the maxillary feelers. This is not reconcilable with the idea of the feelers being secondary parts, or with their name, *maxillary*. The existence of the hand presupposes the existence of the arm. The existence of the feeler presupposes the existence of the part that bears it. I refer you to the genera *Oxycera*,^c *Scatophaga*, *Drapetis*, *Helcomyza*, *Sepsis*, *Tyrophaga*, *Medeterus*, &c. &c. In two of these genera, *Scatophaga* and *Helcomyza*, I find that the feeler springs from a short and nearly quadrate piece, on which it is not placed quite perpendicularly, but leans a little outwards, and to which it is joined by a very evident suture. Is not this smaller basal joint of the feeler the true feeler-jaw? The blade of the feeler-jaws varies little excepting in length. The feelers vary in many particulars: the variation in the number of their joints is worthy of notice. In the *Culicites* they are long and five-jointed, the central joint being the longest. In the *Tipulites* they are short, and have five joints, all the joints being nearly equal in length. In *Bibio*, and its congeners, nearly the same. In the *Tabanites*, *Asilites*, *Muscites*, &c., they appear to be three-jointed; the basal joint short and indistinct; the second more slender, and rather longer; the third stouter and longer than either.

In *Hymenoptera* we find a considerable change takes place in the feeler-jaws. The bees appear to be the nearest

^c *Oxycera*. Maxillæ and mandibles none. Palpi short, linear, membranous and compressed; thickened, opaque and pubescent at the apex.—Curtis.

approach to *Diptera*; and on this account the examination of their mouth is not unimportant. The insertion is a small triangular piece, on which the disk and feeler-bearer are seated. Their union is usually by a distinct longitudinal suture. The feeler is slender, five or six-jointed, and situated close to the base of the blade. The blade is long, slender, flexible, and elastic; it unites with the *ligula*, and labial-feelers in forming a honey-sucking tube. In all these respects, excepting the union with the *ligula*, the feeler-jaws of the bees very closely resemble those of *Lepidoptera*. In *Nomada* the feeler and the blade are of equal length. In *Saropoda* the feeler is about one-fifth as long as the blade. In *Bombus* it is scarcely one-fifteenth the length. In *Melecta* the disk and blade are of nearly equal length: the feeler is about one-third their length. In *Andrena*, *Halictus*, *Dasy-poda*, *Colletes*, *Hyleus*, and *Sphécodes*,^d the length of the blade is much diminished. The division of the other parts is in these genera much more manifest. *Vespa*, *Odynerus*, &c. display a greater change: in these the feeler is much longer than the blade. In *Hedychrum* the feeler-bearer is longer than the insertion and stalk together: the *galea*, or helmet, also reappears in a large oval form; the blade is short; the feeler is long.^e Passing through the *Fossores*, the *Pupivora*, and the *Tenthredinities*, we arrive very nearly at the mouth of *Coleoptera*. In all these the helmet of the feeler-jaw is present under some of its various modifications: it is the terminal portion, and its variations are of the greatest importance as distinguishing characters.

In *Coleoptera*, the feeler-jaws have assumed much more the appearance of the mandibles, than in any class through which we have traced them. Still it is far from certain whether they are, even in this class, employed for mastication. Kirby has excellently suggested that, under their present form, they are the holders or retainers of the food, while the mandibles are employed in masticating it. Their form and situation certainly favour this idea. Dumeril supposes they also assist in mastication.^f The insertion of the feeler-jaw in this class is but

^d With the exception of *S. monilicornis*, before noticed.

^e The description is from the dissections of *Hedychrum* in Curtis's British Entomology.

^f C'est avec les mandibules que l'insecte coupe, arrache ou retient les alimens;

little conspicuous: the disk is an important and considerable part; the feeler-bearer, usually a small lobe, something resembling a basal joint; and the blade long and large, frequently with a sharp-pointed incurved apex, and a ciliated internal margin. The maxillary feelers in this class are constant and conspicuous.^g They are usually composed of four distinct joints,^h and possess great freedom of motion. Geoffroy not unaptly compares the feelers to hands.ⁱ The helmet is also present; and in some of the carnivorous beetles is many-jointed, and wears completely the appearance of a true feeler.^k Fabricius considered it a true feeler in the carnivorous beetles. Latreille, even in his latest work, disapproves of the general application now made of the term to the same part, however different its form.^l It seems strange that one who theorises so boldly and successfully as Latreille has done, should hesitate in acknowledging the obvious identity of the part in question.^m In the *Cicindelites* the feelers are long, four-jointed, and placed on a round compact feeler-bearer, which precisely resembles a fifth joint. The helmet is two-jointed, and longer than the blade, which is incurved and very sharp. In the *Carabites*, the helmet is usually shorter than the blade. In the *Dytiscites* there is no essential difference. In *Parnus*, the helmet

tandis que les mâchoires recoupent, broient ou écrasent la partie qui se trouve comprise entre leur efforts.—*Dumeril*.

^g Les palpes paroissent destinées à palper, à tâtonner l'aliment, à le toucher en tous sens, pour reconnaître ses qualités: aussi les voit-on continuellement en action lorsque l'insecte mange. Dans beaucoup d'espèces ils servent évidemment à redresser l'aliment, afin qu'il soient mieux saisi par les mandibules, dont l'office est d'agir comme les dents incisives et lanières chez les mammifères.—*Dumeril*.

^h There is, in all probability, a uniform number of articulations in the feelers of the insects of every class. It is worthy of remark, that every new discovery in natural history tends to harmonize phenomena previously at variance; and adds to, rather than subtracts from, the symmetry of the whole.

ⁱ Leur usage paroît être de servir comme d'espèce de mains, pour retenir les matières que mange l'insecte et qu'il tient à sa bouche.—*Geoffroy*.

^k La galea prend quelquefois la forme des palpes, ce qui a fait dire que certains *Coléoptères*, tels que les *Cicindela*, avaient six palpes à la bouche: dans ce même genre il est formé de deux articles arrondis et fort allongés; dans d'autres il n'en a qu'un seul; il est souvent terminé par une grosse masse membraneuse, couverts de poils touffus, et quelquefois il est entièrement nu; enfin les *Cetonia* sont entièrement dépourvus.—*Straus-Dürckheim*.

^l Je ne saurais approuver M. Straus qui n'ayant pas égard à ces modifications, donne au galea une acception trop générale.—*Latreille*.

^m See Plate V., and trace the helmet (ö) in Hymenopterous, Coleopterous, and Orthopterous insects.

is a large, obtuse, exarticulate terminal lobe. In the *Hydrophilites*, the maxillary feelers are used as *antennæ*; they are consequently very long: the helmet is a distinct obtuse lobe. In the *Scarabæites*, the feeler-jaws are soft, membranaceous, and hairy; the helmet is extremely pilose and indistinct. In *Lucanus* the helmet is remarkable; it is employed to draw up sap into the mouth, and thus performs the office of a tongue. In the *Cerambycites*, *Curculionites*, &c. all the parts are obvious; their variations are very valuable in generic descriptions. In *Orthoptera*, the parts and appendages of the feeler-jaws are very fully developed. The helmet in this class appears to have reached its maximum; it is frequently, as in *Acridium*, three-jointed: in *Acheta*, the common cricket, it consists of two joints, the basal being the shorter. In *Hemiptera*,^a the feeler-jaws undergo a complete change. Their appendages are obsolete. Their blade is a slender hair, encased in the under lip, already described;^o the pair being united, serrated, and linguiform.

The MANDIBULÆ or *mandibules* constitute the fourth section of the head. They are not situated, in tetrapterous hexapods, more in front or further from the *prothorax* than the feeler-jaws; but in the apterous octopods they retain their position in front, while the feeler-jaws, with their appendages, take up their station immediately behind. The mandibles are situated above the feeler-jaws and below the upper lip, one on each side the mouth. It is worthy of remark, that the mandibles form a striking exception to the rule which assigns to an insect, longitudinally divided down the centre, two equal halves alike in all their parts. The mandibles in those classes, in which they possess the horizontal motion before alluded to, are almost invariably different in the structure of their inner surface. My attention was called to this in the first instance, by finding that

^a In first dissecting the mouth of *Hemiptera*, I had concluded, with the early entomologists, that the long lances were never more than three in number. The central filament, which I then supposed to be the tongue, is certainly, in some *Cimicites*, divisible into two *laciniae*, which I presume correspond with the *maxillæ* of other insects.

^o Tous les auteurs ont écrit que le bec des Hemiptères contenait un sucoir formé par trois soies. Le fait n'est pas exact; le sucoir des Hemiptères se compose toujours de quatre soies, bien distinctes, c'est-à-dire, de deux mandibules et de deux mâchoires. Ces quatre pièces sont cornées, renflées à la base, comprimées et armées de cils ou de dents très aiguës, lorsque les espèces sont carnassières.—*Savigny*.

the outlines occasionally given to illustrate genera, frequently differed from my own dissections. Latreille, and several other entomologists, have been fully aware of this discrepancy, which is occasionally so great, that a figure, however accurate, of a single mandible, will by no means characterise a genus. Every description, therefore, taken from a single mandible, is faulty. I am aware this will be found a sweeping censure; but it appears to me nevertheless a sound one. The mandibles in all these classes have denticulations or teeth more or less developed on their interior margins. It is to be observed, that the mandibles are the *maxillæ* by Linnæus.^p In *Lepidoptera* the mandibles are of a substance and size corresponding with that of the upper lip.^q It does not appear that they perform any office, or are possessed of any motion.^r In *Diptera* the mandibles are elongate, pointed and lancet-like, and in most respects, excepting the want of feelers, resemble the feeler-jaws. They are now possessed of a decided motion, essentially different however from that of the mandibles of masticating insects. Their motion is more of a vertical jerk, by which the insect stabs them into the skin of the object which it attacks. The precise character of the motion has not, however, been satisfactorily ascertained. The variations of the mandibles in *Diptera* are chiefly in size. In *Hymenoptera* the mandibles are abbreviated, osseous, and masticatory. They now have a distinct, free, and powerful horizontal motion, and, with the feeler-jaws, close the mouth laterally. They are subject to little variation throughout the class. In *Coleoptera*, the mandibles are still more developed, forming by far the most conspicuous part of the mouth. They do not so completely

^p *Lucanus scutellatus* : maxillis exsertis apice bifurcatis latera unidentatis.—*Linnæus*.

^q Les mandibules sont d'une exigüeté proportionnée à celle de la lèvre supérieure. Dans la plupart des espèces elles paraissent à la loupe beaucoup moins grandes que les écailles qui couvrent le chaperon : elles sont appuyées sur les deux côtés de la trompe, et trop écartées pour pourvoir se toucher par leur sommet. Leur mouvement est assez obscur et dans certains genres, comme dans les *Sphinx* elles paroissent plutôt soudées au chaperon qu'articulées ; d'autrefois elles font corps avec la base de la lèvre supérieure : elles sont d'ailleurs cornées, très lisses dessus et dessous, vides au dedans, tantôt applaties, tantôt renflées, plus ou moins coniques ; divergentes, parallèles ou convergentes ; pointues ou obtuses, suivant les genres, mais dans tous bordées de cils très-épais sur leur tranchant intérieur.—*Savigny*.

^r See Plate VI. figs 1, 2, 3, 4, i.

close the mouth as in *Hymenoptera*; in some instances not even uniting, except in defence.^s In others, as the beautiful *Cicindelites*, the mandibles cross each other in front of the mouth. In others, the mandibles are at their edges soft and flexible. This is particularly the case with those beetles whose food is the pollen of flowers, as the *Cetoniidæ*.^t Another family, *Aphodiidæ*,^u whose food is the recent excrement of cattle, has a similar peculiarity. In *Orthoptera*, particularly the locust tribes, the mandibles are osseous, large, and powerful. Marcel de Serres discovers, as he imagines, an analogy between the teeth which arm the mandibles of *Orthoptera*, and those possessed by the mammiferous animals. He accordingly names them *incisive*, *canine* and *molar*. Your readers will be pleased by a reference to his paper.^x Though speculative in ideas, it is rigidly accurate in facts. I am not disposed to apply to annulose animals the anatomical terms employed for the vertebrates, unless their propriety be at once manifest.^y In the present instance, moreover, the nomenclature of these parts is not applicable to generic or other characters, and therefore comes not within the compass of this essay. In *Hemiptera*, they undergo a complete alteration; and here, as in *Diptera*, they are elongate, pointed, flexible, lancet-like, and without the horizontal motion.

LINGUA, or *tongue*. The tongue of insects is an organ but little known. This arises, in some measure, from its being generally inconspicuous: and partly from the application of the names *Ligula*, *Lingua*, *Languette*, *Langue*, *Tongue*, &c. to a part, which

* In *Lucanus*, the great Stag Beetle, more particularly; this insect also employs his immense mandibles to pierce the tender bark of young trees. He applies his *antennæ* to the wound he has made, and if he finds that the sap flows, he inserts the helmets of his feeler-jaws in the wound. He sucks up the sap as it flows.

^s Mandibulæ compressæ, tenues, lanceolatæ, membrana subquadrata intus auctæ, hujus latere externo producto et basi vix corneis vel corneis.—*MacLeay*.

^u Mandibulæ clypeo obtusæ, ad basin corneæ, deinde in laminam brevem, compressam, dilatatam, coriaceam aut vix membranaceam productæ.—*MacLeay*.

^x *Annales du Muséum*, No. XIV. p. 56. Les dents des ulonates peuvent se diviser comme celle des quadrupèdes en incisives, en lanières ou canines, et en molaires.—*Marcel de Serres*.

^y Such terms as *nose*, *ears*, and *hands* have been applied to beetles; do they not tend rather to excite a smile, than convey a scientific idea? I do not mention this out of disrespect to the authors of such names, but to shew how very widely fancy may lead us, if we determine on *providing* analogies.

is in reality nothing more than the limb, or elongate process of the under lip. The true tongue is the *hypopharynx* or *lingua* of Savigny. I cannot find it mentioned by Fabricius, except as a *seta* in the mouth of *Diptera*. Cuvier first notices it as a tongue in *Orthoptera*. Savigny clearly points it out in *Diptera*, *Hymenoptera*, *Orthoptera* and *Hemiptera*. Our illustrious countryman, Kirby, applies the term *lingua* to the right part in *Orthoptera*, *Hemiptera*, and *Neuroptera*: but in *Hymenoptera* and *Coleoptera*, he has given this name to the process of the lower lip, already described as the *ligula*. In *Diptera* he has declined naming it.² Latreille, in his earlier works, calls this part by various names; but in his *Cours d'Entomologie*, he clearly points out the true tongue, and laudably proposes that the last name should be restricted to it. My ideas on the subject have somewhat altered since I gave a cursory sketch of the mouth on a former occasion. I am happy in being able thus to point out my own error before the unthankful task has devolved on another. Beautifully has De Geer observed, that the evil is not very great, if further observation prove our old ideas to be untenable; we have then merely to remodel those ideas by the result of the later observation.³ It ever has been, and may it still continue to be, my endeavour to amend an error as soon as I am aware of it. In *Lepidoptera* the tongue has never yet been noticed. Latreille fancied, if I comprehend him rightly, that it existed in the suture, uniting the feeler-jaws.^b I have observed, very near the pharynx, but a little below it in *Sphinx Ligustri*, a small mammiform protuberance. This is so exactly the site of the tongue in bees, that it seems wonderful that the accurate Savigny should have overlooked it. I can

² See Plate VII. fig. 5, in the Introduction to Entomology.

³ Le mal n'est pas même fort grand si par des nouvelles observations on trouve s'être trompé dans ses idées; il n'y a lorsqu'à les changer selon le résultat de ces observations ultérieurs.—De Geer.

^b Amongst these parts (of the mouth in *Lepidoptera*), there seems at first sight no representative of the tongue; but M. Latreille has advanced some very ingenious, and, I think, satisfactory arguments, which go to prove that this part, at least the tongue, in *Hymenoptera*, has its analogue in the intermediate tube or *fistula* formed by the union of the two *maxillæ*, and which conveys the fluid aliment of this order to the *pharynx*. As in *Diptera* the *maxillæ* sometimes merge in the *labium*, so here the tongue (as it were, divided longitudinally) merges in the *maxillæ*.—Kirby.

have no doubt that this is the true tongue. In *Diptera* it is elongate and sharp-pointed, and is the part so named in Curtis's figures of *Anopheles* and *Tabanus*. In *Hymenoptera* it is shorter, but still evident, particularly in the bees, as *Eucera*, &c. In *Coleoptera*, it is still less prominent, and assimilates to its Lepidopterous form already described. In *Orthoptera* it increases in size, and in the common cock-roach very nearly approaches the shape, appearance, and relative size of the human tongue. In *Locusta* it is very large. In *Hemiptera* the tongue is the central and generally the shortest organ of the mouth: it has not, however, escaped the lynx-eyed researches of Savigny and Leon-Dufour.

The next letter relates to the segments which bear the organs of locomotion.

I am, &c.

EDWARD NEWMAN.

Deptford, March 1, 1833.

P. S.—More than once, while this and the three remaining letters have been waiting for publication, have I resolved on suppressing them, and abandoning, to abler hands, the task I have so rashly undertaken. As often has the kind, but I fear ill-judged partiality of personal friends induced me to revise and reserve them for publication. I too have reflected, that these memoranda, trifling and imperfect as I know them to be, thrown thus piece-meal into the great mass of human knowledge, would not be altogether lost. The widow's mite was not unacceptable. If each of us then does his best, let not his fellow-labourers judge him too severely. Provided the continuation of this subject proves to be against the judgment of your readers, I sincerely hope they will express as much, and it shall be most cheerfully withdrawn.

My name stands alone as the author of these letters; their production, however, is a joint concern, and my part is by far the least meritorious. There is, I am sure, in human nature, a tendency to commend the effort to do well. Ours has been, and is, and—unless required to be suspended—shall be, an effort to do well. If then a kind approving thought occur to even one of your readers, let it be given exclusively

to my friend, whose skill as an engraver, aided by his intimate knowledge of the subject, has mainly contributed to render these pages intelligible. I may say with Marcel de Serres : In this work I have no merit but that of generalizing.*

ART. VII.—*Essay on the Classification of Parasitic Hymenoptera, &c.* By A. H. HALIDAY, Esq. M.A.

(Continued from Vol. I. page 491.)

Of the Ichneumones of the Second Line, (Ichneumones adsciti, Essenbeck.)

Subgen I.—APHIDIUS.

Aphidius. *Essenbeck.* Fam. II.

Areola disci antica et cubitalis interior confluentes: stigma trigonum: abdomen lanceolatum petiolatum vel subpetiolatum: valvula ventralis inermis: antennarum articulorum numerus varius mari auctus: palpi vari.

Areola magna irregularis disci fere ut in *Ichneumonidibus* genuinis sita est, a cubitali exteriori sæpius equidem vix apice discreta; mox etiam limites posticè sensim oblitterati evanescent in aliis, areolâ ut in *Trioxei* penitus effusâ: antennarum vero norma in singulis speciebus non adeo mutabilis ut ejus ratio prorsus negligenda sit, unius aut alterius articuli incrementum facillè patitur, vel etiam plurium siquibus ille numerus viginti in universum superet: abdominis segmentum dorsale secundum impressione transversa bipartitum est, incisurâ ventrali secundâ ibidem pallido-perlucente; inde fit quod abdomen nunquam totum nigrum extat. Quæ semel monuisse satis sit.

Species quum ingenti copia, tum characterum subtilitate vel etiam inconstantia implicitæ, discrimen curatius locorum atque victus ratione confirmatum postulant. Quæ modo ut attingam non tempus otium nec industria fiduciam præstitere. Satis habui nonnullas sectiones quarum ope forsitan ista multitudo commodius

* Dans ce travail je n'ai d'autre mérite qui d'avoir generalisé.—*Marcel de Serres.*

digeri possit, indiciis saltem levibus demonstrasse, exemplis perpaucis vel singulis tantum ubique subjectis: in quæ (opus sane jejunum atque mancum) solertiorum animadversiones et addita-menta sollicitè peto.

Tabula Synoptica Sectionum.

Aculeus	{	<p>pallidus</p> <p>niger,</p> <p>palpi</p> <p>maxillares</p>	{	<p>4-articu-</p> <p>lati,</p> <p>labiales</p>	{	<p>3-articulati,</p> <p>caput</p> <p>2-articulati,</p> <p>cubitus</p> <p>3-articulati,</p> <p>alæ</p> <p>2-articulati</p>	{	<p>thorace latius . .</p> <p>thoracis latitudine</p> <p>dimidiatus . . .</p> <p>brevissimus . . .</p> <p>completæ . . .</p> <p>nullæ</p> <p>.</p>	<p>FALCIGERI.</p> <p>PINICOLÆ.</p> <p>TRIVIALES.</p> <p>FAMILIARES.</p> <p>EXAREOLATI.</p> <p>SEROTINI.</p> <p>APTERI.</p> <p>BREVIPALPES.</p>
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SECTIO I.—FALCIGERI.

Caput vix thoracis latitudine rotundatum, postice magis coarctatum: palpi maxillares 4-, labiales 3-articulati: mesothoracis scutum læve glabrum: stigma mediocre, areola completa; abdomen *feminae* lanceolatum, *mari* brevius obovatum, petiolo lineari: aculeus pallidus cuspidatus nonnihil decurvus.

Sp. 21. A. *Crepididis*. Fem. *Petiolo valido ante medium dentato, aculeo decurvo inferne angulato, antennis 13-articulatis.* (Long. .09 — .12; alar. .16 — .20.)

Fem.—Luteo-ferrugineus, caput et thorax supra nigro-fusca: antennæ breviusculæ concolores scapo lutescentes: alæ fuscanae stigmatibus in vivis luteo in exsiccatis piceo, radice et squamulis fusco-piceis: pedes posteriores, nonnunquam antici quoque, femorum et tibiæ lateris externo tarsisque fuscis, tibiis basi luteis: petiolus ante medium valide dentatus, fere ut in subgeneribus *Trionnyche* et *Monoctono*: segmenta intermedia abdominis lateribus vel dorso toto infusca: aculeus fere ut in *Monoctono* effictus dorso infuscatus.—*Mas*, niger, antennæ concolores 16-articulatæ: os lutescens: pedes obscuriores quam *feminae*, coxis posticis nigris: abdomen piceum, petioli basi apiceque, segmento secundo medio lutescentibus.

Variat.—Femina rarius antennæ basi latius, pedibusque totis lutescentibus.

Habitat in Aphidibus *Crepididis Tectorum*.^a—(*Mus. Soc. Ent.*)

^a The Pucerons, containing this parasite, may be found adhering to the calyx-scales of the Succory Hawk-weed.

Sp. 22. *A. constrictus*. Fem. *Petiole gracili medio noduloso, aculeo conico apice perparum deflexo, antennis 16-articulatis*. (Long. .09—.12; alar. .16—.20.)

Bracon constrictus. Ess. B. M. V. 28. Sp. 44. Tab. II. fig. 8.

Statura gracilior quam præcedentis.—Fem. Pallide flavus, capite et thorace supra fuscis, postpectore nonnunquam infuscato: antennæ graciles fuscae basi flavescens, rarius 15-articulatae: palpi prælongi: alæ hyalinae nervis dilute piceis, stigmate flavo, in exsiccatis pallido, radice et squamulis stramineis: apex femorum et tibiæ posteriorum latere externo, tarsorum undique fuscens: petiolus gracilior, quam præcedenti haud dentatus: abdominis segmenta intermedia lateribus infuscata: aculeus longior et gracilior quam illi, apice summo tantum leviter decurvo.—Mas, caput et thorax nigra: palpi fusco-pallidi: antennæ 18-articulatae nigrae: alarum stigma dilute piceum in vivis lutescens, radix et squamulae piceae: pedes luridi seu sordide lutescentes, posteriorum coxæ basi, femora, tibiæ medio tarsique apice infuscata; abdomen luridum fusco-nebulosum.

Habitat in Aphidibus *Aceris Pseudoplatani*,^b &c.—(Mus. Soc. Ent.)

SECTIO II.—PINICOLÆ.

Caput valde oblatum thorace latius, oculis extantibus, fronte et hypostomate latissimis: palpi maxillares 4-, labialis 3-articulati: antennæ *feminae* circiter 20-articulatae, *maris* 25-articulatae (*A. adscitus* autem cujus *mares* soli adsunt hunc numerum non accedit): mesothoracis scutum sulculis binis ordinariis parum profundis, nonnunquam alio intermedio abbreviato et obsoletiore impressum: alæ latae stigmate latissimo trigono, areola completa. Abomen *feminae* oblongo-lanceolatum apice compressum, *maris* brevius lineari-clavatum, petiolo postice dilatato: aculeus niger haud decurvus.

Ova ponunt in Aphides lanigeras *Coniferarum*, autumnis obviæ.

Sp. 23. *A. pictus*. Fem. *Petiole sensim incrassato aculeo arcuatim ascendente*. (Long. .17—.20; alar. .27.)

Fem. Luteus: antennæ, oculi, macula verticis, margo occipitis, tempora, lituræ tres scuti cum scutello, metathorax et petiolus

^b The Pucerons infested by it turn white, and among such winged individuals are occasionally found.

nigri: mesothoracis scutum nitidum subtilissimè punctulatum: alæ hyalinæ nervis fuscis, stigmate fusco-ferrugineo, radice et squamulis lutescentibus: pedes antici immaculati, intermediï infuscati, postici fusci trochanteribus, femoribus subtus tibiisque basi et apice sordide luteis: petiolus granulatus opacus a basi inde fere æqualiter incrassatus, apice ipso vix latiore, tuberculis ante medium sitis inconspicuis: abdomen valde elongatum apice resupinatum, segmentis anterioribus dorsi infuscatis: aculeus gracilis arcuatus ascendens, metatarsi postici fere dimidiâ longitudine.—*Mas*, incognitus.

Habitat in Pinu sylvestri rarissimè.

Sp. 24. *A. pini*. Fem. *Petoli apice obconico-dilatato, stigmate latissimo, aculeo brevi obtuso, antennis nigris.* (Long. .15—.18; alar. .27—.29.)

Fem. Niger, hypostomate et propectore luteo-pictis, mesothoracis scuto opaco punctulatissimo, vel luteo lituris tribus effusis nigris, vel limbo tantum lutescente: caput latissimum: stigma quoque adhuc latius quam in cæteris: alæ hyalinæ apice et substigmate infumatæ, stigmate nervisque fuscis, radice et squamulis stramineis: pedum colores obscuriores quam in præcedente, coxis intermediis insuper infuscatis: petiolus basi constrictus, medio tuberculatus, dehinc in apicem cito dilatatus inæqualis punctulatus: abdomen minus elongatum nigrum s. piceum, segmento secundo medio, nonnunquam incisuris anterioribus quoque pallidis: aculeus brevis latus obtusus, horizontalis aut suberectus.—*Mas*, niger segmenti secundi medio pallescente, pedum colore luteo minus effuso, coxis omnibus nigris: alæ candidæ stigmate nervisque nigris, radice et squamulis piceo-stramineis: petiolus apice parum dilatatus.

Habitat in Pinu sylvestri et Larice. (Mus. Soc. Ent.)

Sp. 25. *A. infulatus*. Fem. *Petoli apice dilatato, aculeo brevi obtuso, antennis apice flavis.* (Long. .11—.16; alar. .21—.29.)

Fem. Caput luteum vertice et oculis nigris: antennæ nigræ scapo luteo, articulis extimis quinque aut sex flavis, ultimi apice fusco: thorax niger propectore luteo: mesothoracis scutum nitidum subtiliter vage punctulatum: alæ hyalinæ apice et substigmate infumatæ, nervis fuscis, stigmate fusco-ferrugineo, radice et squamulis stramineis: pedes lutei, posteriores late fusco-nebulosi,

coxæ posticæ fusco-maculatæ : abdomen luteum, segmentis anterioribus dorsi infuscatis, posticis immaculatis : petiolus fere qualis *A. pini*, apice tamen minus dilatatus, niger : aculeus ut in illo.—*Mas.* niger : antennæ quam in cognatis graciliores videntur, totæ nigræ : alæ hyalinæ stigmatate nervisque fuscis, radice et squamulis obscure stramineis : pedes antici straminei latere externo obscuriores, posteriores fuscii trochanteribus fere totis, tibiis basi et apice tarsisque basi stramineis ; coxæ omnes nigræ : abdomen piceum plagâ mediâ lutescente : petiolus apice vix dilatatus.

Habitat in Larice rarius.—(*Mus. Soc. Ent.*)

Sp. 26. *A. Laricis.* Fem. *Petoli apice perparum dilatato, aculeo brevi cuspidato.* (Long. .11—.15 ; alar. .19—.24.)

Fem.—Niger : mesothoracis scutum nitidum subtiliter vage punctulatum : alæ hyalinæ apice et substigmatate infuscatæ, stigmatate nervisque nigro-fuscis, radice et squamulis piceo-stramineis : pedes antici lutescentes latere externo infuscatis, tarsis fuscis, postici fuscii, trochanterum apice, tibiisque basi et apice sordide luteis ; coxæ omnes nigræ : abdominis segmentum secundum medio, rarius etiam incisuræ anteriores piceo-pallidæ : aculeus brevis erectus apice attenuatus.—*Mas.* alis candidis immaculatis et pedibus obscurioribus.

Habitat in Larice e cujus Aphidibus prodiit mihi.—(*Mus. Soc. Ent.*)

SECTIO III.—TRIVIALES.

Palpi maxillares 4-, labiales 3-articulati : caput thoracis latitudine : mesothoracis scutum læve glabrum : stigma mediocre : areola completa : abdomen *feminæ* oblongo-lanceolatum, *mari* brevius lineari-clavatum, petiolo fere lineari inæquali : aculeus brevis obtusus horizontalis niger.

Ova ponunt in Aphides genuinas (e sectione *A. Steph. Cat.*)

Sp. 27. *A. Rosæ.* Fem. *Luteus antennis, vertice thoraceque nigris, propectore luteo, abdomine bifarium fusco-maculato, pedibus posterioribus infuscatis, antennis 17-articulatis.* (Long. .12—.14 ; alar. .20—.23.)

Ichn. Aphidum. *De Geer.* II. 866. Tab. XXX. fig. 4—13.

Id. *Schr.* F. B. II. 307. No. 2146.

Id. *Geoffr.* II. 322. 4.

Fem.—Alæ hyalinæ nervis fuscis, stigmatibus luteo, in exsiccatis piceo, radice et squamulis stramineis: pedis intermedius fusco-nebulosus, postici coxis et femoribus, tibiis medio tarsisque fuscis: petiolus fuscus apice lutescens: abdominis segmenta anteriora utrinque fusco-maculata.—Color luteus in hac specie clarior fere in croceum transit.—*Mas*, niger ore luteo, palpis piceo-pallidis: antennæ 20-articulatæ: alarum radix et squamulæ picescentes: pedes antici lutei fusco-lineati, posteriores picei trochanteribus et tibi- arum basi lutescentibus; coxæ omnes nigrae: abdomen piceum segmenti secundi medio et incisuris lutescentibus.

Habitat in Aphidibus, *Rosæ*.^c—(*Mus. Soc. Ent.*)

^c This is the species most frequently noticed by authors, being a familiar inhabitant of our gardens, where the male may be seen throughout the summer hovering over the rose-trees, or creeping under the leaves. His partner is of less roving habits, and will generally be found busy in providing for the establishment of her numerous progeny. Placed at her birth amid the myriads of Pucerons which encircle the young shoots of the rose, she has no dwelling to construct with artful industry, nor stores of food to collect by distant roving. With extended antennæ and wings, "shivering with desire," she paces leisurely among the defenceless herd, and as soon as she has selected one by a light touch of her antennæ, she stops short at about her own length from it, and rising on stiffened legs, bends her abdomen under her breast till the end of it projects beyond her mouth; then erecting her thorax by depressing the hinder-part, she simultaneously makes a lunge forward with the abdomen, which is then extraordinarily lengthened, and by a momentary touch, deposits an egg on the *under-side* of the Puceron, near its tail. The victim will sometimes kick and sprawl, so as to discompose her; but being anchored by its sucker plunged in the bark, can make no effectual attempt to elude the deadly weapon. Should it, however, be wandering at large and free to struggle, she shows great activity in traversing around it in the attitude of attack till she can take it in flank. The delicate sense of the antennæ seems to warn her where a germ has been already deposited, as she will pass by those which have been stung some days before; and I have never found more than a single grub in each individual. When all the interior of the Puceron is consumed, it will be found separate from its fellows, and motionless, usually on the upper side of a leaf, to which it is glued by some viscid exudation. It now appears distended, and of an opaque hazel or lighter tint. If opened, the full-fed grub of the *Aphidius* will be discovered doubled up, and filling the cavity, its head being next the tail of the Puceron. In a short time the parts of the perfect insect are developed in a quiescent state and in the same position, the integuments of the grub being shrivelled up below it in black grains. Like *Cynips* and *Callinome* it spins no cocoon for its transformation, being adequately protected by the indurated skin of its victim. A few days are sufficient to give consistence to its parts; and while the new risen sun is yet glistening in the early dews, the winged insect, by a push of its head, detaches the latter rings of its case, which separate in the form of a circular lid, often springing back to close the orifice after the inhabitant has gone forth, born in the maturity of her energies and instincts, to renew the circle of existence. Sometimes, indeed, a different occupant will issue from its dark chamber, as several still minuter parasites of the present order (*Megaspilus Carpenteri*, Curt. E. B. 249. *Cynips*

Sp. 28. *A. lutescens*. Fem. *Luteus oculis et antennis nigris, vertice, lituris tribus scuti, scutello, metathorace et petiolo fuscis*. (Long. .13; alar. .24.)

Fem.—Statura et magnitudo *A Rosæ*: antennarum scapus lutescens: alæ ut in illo: pedes immaculati: abdominis segmenta anteriora dorso transversim infuscata.^d

Sp. 29. *A. Avenæ*. Fem. *Niger pedibus anticis et geniculis rufo-piceis, stigmatibus anoque ferrugineis, antennis 17-, 18-articulatis*. (Long. .12—.15; alar. .20—.24.)

Bracon picipes . *Ess. B. M. V.* 28. Sp. 42?

Aphidius picipes . *Ess. Act. Acad.* ?

Fem.—Os lutescens, palpi subfusci: alæ hyalinæ stigmatibus rufo-ferrugineis, in exsiccatis piceo, nervis fuscis, radice et squamulis piceis: pedes nigro-picei, antici femoribus tibiisque rufo-piceis aut lutescentibus, latere externo fusco-lineatis, posteriores trochanterum apice tibiisque basi et apice concoloribus: abdomen nigro-piceum segmenti secundi medio pallescente, ano rufo-ferrugineo.—*Mas*, palpi nigro-picei: antennæ 20—22-articulatæ: pedes obscuriores: anus haud ferrugineus: *A Rosæ* ♂ simillimus.

Habitat in *Aphidibus Avenæ* passim omnium vulgatissimus.^e—(*Mus. Soc. Ent.*)

Aphidum, Geoffr. II. 305. 26. *Cyrtogaster vulgaris*, Walker, Ent. Mag. I. 382, &c.) select for the nidus of their progeny those Pucerons within which the grub of the *Aphidius*, or of its fellow-devourer, *Cynips erythrocephala*, (Jur.) is silently gorging, and the destroyer becomes the destroyed in turn. Some of these last (*Coruna clavata*, Walk. Ent. Mag. I. p. 386), not content with the covering which protects the *Aphidius* to its final change, when they are full fed leave the cavity, and spin a white silky web between the belly of the Puceron and the leaf, and in this undergo their transformation. Max. Spinola has given occasion to some confusion, by appropriating to a species of *Microgaster*, synonyms and observations which belong to insects of the present genus. The accurate account of their habits, long since given by Frisch, Cestoni (in Vallisnieri's works), and De Geer, might be supposed sufficient to have cleared up this mistake which has been pretty generally followed, the Linnaean *Ich. Aphidum* being, however, replaced in its proper station by Fallen and Curtis.—On this account, I have ventured to reiterate the detail from my own observations. The Pucerons, to which these relate, abound on almost every rose of our gardens, except the sweet-briar, which nourishes a distinct species, and its peculiar parasite.

^d I should have been inclined to consider this as an immature variety of *A. Rosæ*; but that individuals of this last have assumed their characteristic tints before they are disclosed from the puparium.

^e I have observed the proceedings of this species, which are precisely similar to those of *A. Rosæ*; the Pucerons pierced by it are found adhering to the grains of oats, the flower-heads of *Hypochaeris radicata*, &c.

Sp. 30. A. Ervi. Fem. *Capite thoraceque nigris, antennarum scapo, hypostomate, collo pedibusque luteis, antennis longis 20-articulatis.* (Long. .14—.17; alar. .22—.26.)

Statura gracilior quam præcedentibus, antennis, palpis et pedibus longioribus.—*Fem.* antennæ 19—21-articulatæ: palpi lutei: alæ hyalinæ seu fumato-hyalinæ, stigmatibus luteo, in exsiccatis piceo, nervis fusco-ferrugineis, radice et squamulis piceo-stramineis: ungues antici et tarsi posteriores apice fusci, coxæ posticæ fusco maculatæ: abdomen piceum segmento secundo medio, reliquis margine, posticis sæpe totis lutescentibus: petiolus quam in præcedentibus gracilior et apice nonnihil lator.—Color luteus hujus in ferrugineum transit.—*Mas*, niger ore luteo, palpis fuscis: antennæ circiter 23-articulatæ nigrae: coxæ posteriores, femora intermedia basi tantum, postica cum tibiis latere externo tarsisque fere toti fusci: abdomen piceum segmenti secundi medio lutescente.

Variat femina multimodis, nonnunquam coloribus obscurioribus *mari* descripto similis; hic vero pedibus fere totis palpisque nigris.

Habitat in Aphidibus *Ervi* et *Trifolii* passim copiosè.—(*Mus. Soc. Ent.*)

Sp. 31. A. Urticæ. Fem. *Pallide flavus, capite thoraceque supra et abdominis vittâ dorsali interruptâ fuscis, antennis 18-articulatis.* (Long. .15; alar. .23.)

Fem.—Statura valde gracilis: antennæ graciles ferrugineæ basi late flavicantes: thoracis dorsum fuscum aut ferrugineum scutello dilutiore: alæ hyalinæ stigmatibus nervisque dilute fuscis, radice et squamulis pallide stramineis: abdomen elongatum, postice valde compressum et carinatum, segmentis anterioribus dorso transversim infuscatis: petiolus gracilis fuscescens.

Habitat in *Urticâ* rarius.—(*Mus. Soc. Ent.*)

SECTIO IV.—FAMILIARES.

Antennarum et palporum labialium articuli pauciores discrimen inter hanc et præcedentem sectionem ægrè præstant. Reliqui characteres in utramque satis conveniunt.

Sp. 32. A. Asteris. Fem. *Capite thoraceque nigris hypostomate, propectore, pedibus anticis et geniculis, abdominisque basi et apice luteis, antennis 15-articulatis.* (Long. .11; alar. .20.)

Fem.—Pictura fere qualis *A. Rosæ*, coloribus autem sordidioribus : palpi apice picescentes : antennæ graciliores quam in sequentibus, totæ nigræ : alæ hyalinæ stigmatate sordide flavo in exsiccatis piceo, nervis fuscis, radice et squamulis piceo-stramineis : pedes sordide flavi, femora latere supero, postica fere tota, tibiæ posteriores basi demtâ tarsique fere toti fusci : coxæ posteriores nigræ : abdomen sordidè flavum segmentis intermediis infuscatis, secundi medio flavescente.—*Mas*, niger ore sordide lutescente ; antennæ 18-articulatæ : pedes picei anticorum femoribus tibiisque subtus, trochanterum apice et geniculis omnibus ferrugineis : abdomen piceum petiolo flavo fuscoque, segmenti secundi medio flavescente.

Habitat in Aphidibus *Asteris Tripolii* copiosè.—(*Mus. Soc. Ent.*)

Sp. 33. *A. Ribis*. *Fem. Capite thoraceque fuscis, antennis basi, hypostomate, collo, pedibus, abdominisque basi et apice flavis, pedibus posterioribus indistincte annulatis, antennis 15-articulatis.* (Long. .07—1 ; alar. .14—.19.)

Fem. Caput et thorax fusca aut nigro-fusca, pectus dilutius : antennæ fuscae scapo et pedicello flavis : alæ hyalinæ stigmatate flavo, in exsiccatis picescente, nervis dilute fuscis, radice et squamulis piceo-stramineis : pedes flavi femorum apice supra, tibiis medio tarsisque apice subinfuscatis : abdomen flavum segmento secundo basi et apice, sequentibus dorso infuscatis, ano immaculato.

Prodiit mihi ex Aphidibus *Ribis rubræ*. †—(*Mus. Soc. Ent.*)

Sp. 34. *A. Cirsii*. *Fem. Capite thoraceque nigris aut nigro-fuscis, antennarum basi, collo, pedibus abdominisque basi flavo-ferrugineis, antennis circiter 15-articulatis.* (Long. .08—.11 ; alar. .16—.19.)

Ichneumon Aphidum. L. F. S. 1643 ?

Fem.—Antennæ 15-, 16-, in unico tantum 17-articulatæ, basi obscure flavescentes : ungues fusci, coxæ posticæ quoque fusco-maculatæ : abdomen piceum apice obscurius, petiolo flavo-ferrugineo, segmento secundo basi et medio flavescente.

Variat quoque pedibus posterioribus et petiolo fusco-nebulosis.

Habitat in *Cirsio arvensi* non infrequens. § (*Mus. Soc. Ent.*)

† The Pucerons, which inhabit the puckered leaves of the currant, when infested by this species, acquire a peculiar pearly gloss, as remarked by Réaumur, Tom. III. Mem. IX. p. 286.

§ I have not obtained this species out of the Pucerons of the thistle which it

Sp. 35. A. Eglanteriæ. Fem. *Niger abdominis basi flavo-ferruginea, pedibus concoloribus fusco variis, antennis circiter 15-articulatis.* (Long. .07—.1; alar. .14—.18.)

Fem.—Os palpique picei: antennæ 14-, 15-articulatæ nigræ: collum ferrugineum aut thoraci concolor: femora latere externo, tibiæ medio, tarsi apice, plerunque etiam coxæ posticæ infuscatæ: abdomen piceum petiolo flavo-ferrugineo rarius infuscato, segmenti secundo medio et incisuris anterioribus flavescentibus.—*Mas*, niger pedibus fuscis, anticis subtus et geniculis omnibus lutescentibus: abdomen obscurius quam *feminæ*.

Prodiit mihi ex Aphidibus Rosæ Eglanteriæ.^h—(*Mus. Soc. Ent.*)

Sp. 36. A. Salicis. Fem. *Niger, pedibus anticis et geniculis ferrugineis, abdominis liturâ pallescente, antennis 13-articulatis.* (Long. .08—.1; alar. .15—.18.)

Fem.—Os sordide lutescens: antennæ capite cum thorace parum longiores, apice subcrassiores: alæ hyalinæ stigmatibus lutescentibus, in exsiccatis piceo, nervis dilutius fuscis: pedes anteriores obscure ferruginei, intermediarum femora basi, tibiæ medio tarsique fuscis, postici fuscis trochanteribus et tibiis basi apiceque ferrugineis: coxæ omnes nigræ: abdomen segmenti secundi medio et incisuris, vel plagâ media effusa pallescente: petiolus fuscus aut piceus.—*Mas*, color pedum et abdominis sordidior: antennæ 15-, 16-, rarius etiam 17-articulatæ: alæ albicantes.

*Habitat in Salice autumnis exeunte frequens; e cujus Aphidibus quoque prodiit mihi, Junio mense.*ⁱ (*Mus. Soc. Ent.*)

Adsunt individua minora in flosculis *Dauci Carotæ* copiosè lecta vix propriæ speciei.^k

SECTIO V.—EXAREOLATI.

Palpi maxillares 4-, labiales 2-articulati: stigma latum: areola penitus effusa: cubitus abruptus, stigmatis vix dimidiâ longi-

frequens; it would be remarkable that a species so closely resembling the preceding and the following, should be attached to such dissimilar Pucerons.

^h These Pucerons become glossy white, fixing themselves on the under-side of the leaves.

ⁱ The wounded Pucerons of willows usually retire to the points of the leaves, and become hazel or light-brown. Of the multitudes thus infested, the majority fall victims not to the present insect, but to two minute species of *Cynips* (*C. fulviceps*, Curt. and another): the former of these, with some allied species, destroys also the Pucerons of cow-parsnip and other plants.

^k There are several still smaller species closely allied to this, as *A. Faniculi*, *A. viminalis*, &c.

tudine: reliqui characteres cum proxime præcedentibus conveniunt; aculeo nonnihil difformi.

Sp. 37. *A. leucopterus*. Fem. *Ater nitidus alis albis, pedibus pallido-annulatis, antennis 15-articulatis*. (Long. .085; alar. .16.)

Fem.—Antennæ graciles nigræ: alæ albo-hyalinæ stigmatæ flavo: pedes antici lutescentes, posteriores nigro-picei trochanteribus basique tibiæ et tarsorum pallidis: abdomen nigro-piceum plagâ media dilutiore: aculeus basi supra angulatus, apice acuminatus.—*Mas*, antennæ 16-articulatæ: alæ candidæ: pedes omnes nigro-picei pallido-annulati: abdomen nigrum segmenti secundi medio obsoletius pallescente.

Habitat in *Coniferis*, autumnno rarissimè.

SECTIO VI.—SEROTINI.¹

A congeneribus sectionis quartæ palporum structurâ præcipue discreti. Palpi breves maxillares 3-articulati articulo penultimo crassiore, labiales 2-articulati.—Species nonnullæ minores tam ex hac quam ex illa sectione antennis brevibus pauci-articulatis et capite crassiore se efferunt.—*A. ambiguus*, No. 42, propter formam petioli et aculei et areolam penitus effusam a reliquis discrepat.

Sp. 38. *A. Matricariæ*. Fem. *Niger pedibus anticis, geniculis abdominisque basi ferrugineis, antennis 14-articulatis*. (Long. .07—.09; alar. .14—.18.)

Fem.—Palpi fuscii: antennæ filiformes nigræ vel basi picescentes: alæ hyalinæ stigmatæ dilute piceo, nervis fuscis: pedes ferruginei, antici supra fusco lineati, posteriorum coxæ, femora, tibiæ medio tarsique apice fuscii: abdomen nigro-fuscum petiolo ferrugineo, segmento secundo medio pallescente: aculeus brevis obtusus.

Variat collo ferrugineo aut nigro, pedum quoque fuscinedine plus minusve effusâ.

Habitat in *Pyrethro inodoro* et *maritimo* minus frequens. (*Mus. Soc. Ent.*)

¹ To this section belong also *A. pallidinotus*, (Curt.) and several other species nearly allied to *A. Matricariæ* and *A. fumatus* respectively.

Sp. 39. *A. Arundinis*. Fem. *Niger aut fuscus antennis basi, ore, collo, pedibus et abdomine antice flavo-ferrugineis, antennis 14-articulatis*. (Long. .08; alar. .16.)

Fem.—Palpi flavo-ferruginei: antennæ nonnunquam 15-articulatæ: alæ hyalinæ stigmatibus dilute piceo s. pallido, nervis plerisque decoloribus et areolâ vix designatâ, radice et squamulis stramineis: aculeus brevis obtusus:—*Adsunt* individua forsitan immatura nigredine in colorem rufo-piceum mutata, scutelloque rufescente, vix specie diversa.

Habitat in *Arundinetis* autumnis parum frequens. (*Mus. Soc. Ent.*)

Sp. 40. *A. fumatus*. Mas. *Piceo niger geniculis tarsisque pallidis, abdomine spathulato lurido, alis fuscis, areola indistincta, antennis crassiusculis 16-articulatis*. (Long. .07; alar. .14.)

Mas.—*Monoctono Caricis* ♂ non dissimilis: palpi brevissimi: alæ obscuræ stigmatibus angustis, cubito leniter arcuato, areola postice indistincta aut effusa: abdomen spathulato dilatatum, petiolo crasso lineari.

Habitat in pratis humidis *Ranunculo acris* obsitis frequens. (*Mus. Soc. Ent.*)

Sp. 41. *A. exiguus*. Fem. *Niger geniculis abdomineque antice pallidis, antennis brevibus 13-articulatis*. Long. .07; alar. .13.)

Fem.—Os ochreum: antennæ capite cum thorace parum longiores, apice subcrassiores: alæ obscure hyalinæ stigmatibus piceo-pallidis, areola indistincta: pedes picei geniculis pallidis: abdomen basi et medio pallescens, lateribus et postice piceum: petiolus fere linearis apice sensim paulo crassior, flavidus: aculeus obtusus. *Anne conjunctæ præcedentis?*

Sp. 42. *A. ambiguus*. Fem. *Niger abdominis basi pedibusque pallidis, posterioribus fusco-cingulatis, abdomine subsessili, aculeo cuspidato, areolâ effusâ antennis 13-articulatis*. (Long. .07; alar. .14.)

Fem.—Antennæ filiformes nigrae, palpique longiores quam præcedenti: alæ hyalinæ stigmatibus piceo pallidis: pedes flavo-pallidi unguiculis et coxis, posteriorum femoribus et tibiis medio, tarsisque summo apice fuscis: abdomen breviter ovato-lanceolatum,

antice pallescens postice piccum, segmento primo brevi cyathiformi lateribus angulato.

Habitat cum præcedentibus rarius.—(*Mus. Soc. Ent.*)

SECTIO VII.—APTERI.

A præcedentibus illo caractere unicè distinguendi.

Sp. 43. *A. Ehippium*. Fem. *Flavo-ferrugineus capite, metathorace et abdomine posticè fuscis, antennis 14-articulatis*. (Long. .06—.08.)

Fem.—Antennæ fusæ basi flavescentes: abdomen fuscum basi pallescens: petiolus gracilis linearis flavus aut ferrugineus: aculeus obtusus niger.—*Variat* coxis posterioribus, femoribus tibiisque medio subinfuscatis.

Habitat ——— rarius.—(*Mus. Soc. Ent.*)

SECTIO VIII.—BREVIPALPES.

Palpi multo breviores quam in ceteris *Ichneumonibus*; maxillares 2-articulati subclavati, labiales ex-articulati: mesothoracis scutum læve glabrum: alæ angustæ stigmatè tenui, areolæ nervo postico-exteriore basi oblitterato, dehinc ad apicem areolæ perbrevis spatio refecto; quæ nota satis singularis oculatissimum Neesium ab Essenbeck nequaquam effugerat.

Sp. 44. *A. dissolutus*. Fem. *Niger nitidus abdominis basi, pedibusque pallidis, posterioribus fusco variis, alis denigratis, antennis crassis 16-articulatis*. (Long. .07—.09; alar. .15—.18.)

Bracon dissolutus . *Ess. B. M. V.* 29. Sp. 46.

Fem.—Antennæ nigræ articulo tertio pallescente: alæ basi dilutiores: pedes antici fere toti, posteriorum coxæ, trochanteres, genua tarsique pallidè flavi: abdomen breviter ovato-lanceolatum, piccum antice pallescens, segmento primo brevi cyathiformi (seu basi constricto dehinc dilatato fere rectangulo): aculeus subexertus niger obtusus.—*Mas.* antennæ longiores totæ nigræ, articulis magis discretis (in unico illo quem vidi 16-articulatæ tantum): alæ dilutiores quam *feminæ*: femora et tibiæ anticæ latere externo infuscatæ: pedes posteriores fusci, genubus tarsis-

que lutescentibus: abdomen piceum basi sordidius lutescens, petiolo minus dilatato.

Habitat in pratis *Ranunculo acris* obsitis rarissimè.—(*Mus. Soc. Ent.*)

Restant adhuc quatuor species olim descriptæ,

A. Aparines *Ichn. Aphidiphagus*. Schr. F. B. II. 2147.

A. Dipsaci Schr. F. B. II. 2149.

A. infirmus *Ess. B. M.* V. 28. Sp. 43.

A. melanocephalus . *Ess. B. M.* V. 29. Sp. 45.

mihi incognitæ, de quarum loco propterea nil temere proferre placet.

Note.—As the variations of the palpi in this genus are not always indicated by any evident distinction in other external characters, I have sought, where an opportunity offered, to obtain a view of them in recent specimens; but in many cases have been obliged to content myself with relaxing the parts. As, however, such minute characters may be easily mistaken on a superficial view, I wish to enumerate the species whose trophi were submitted to actual dissection:—Nos. 3, 5, 7, 8, 9, 10, 11, 17, 21, 22, 24, 27, 29, 30, 32, 34, 36, 37, 39, 40, 43, and 44. A. H. HALIDAY.

3, New Cumberland-street, Dublin.

Nov. 22, 1833.

ART. VIII.—*Notice of Entomological Works.*

1. *British Entomology*; by John Curtis, F. L. S. &c.—Nos. 117—120.—Pl. 466. *Elophorus fennicus* (Coleoptera Helophoridae); 467. *Aspilates gilvaria*, (Lepidoptera Phalaenidae); 468. *Psithyrus rupestris*, (Hymenoptera Apidae). *Psithyrus* of Dahlbom and Curtis falls, because *Psithyrus* is a name applied by Hübner to a genus of *Sphingidae*. This genus of bees is of very singular economy; like the cuckoo, it lays its eggs in a nest not its own: a circumstance unusual among bees. The characters as laid down by Mr. Curtis do not, we think, sufficiently distinguish it from *Bombus*. Pl. 469. *Barborus hamatus*, (Diptera Muscidae); 470. *Hister 4-maculatus*, (Coleoptera Histeridae). This is the *Hister sinuatus* of

authors. *Hister 4-maculatus* is very distinct. Pl. 471. *Adactylus Bennetii*, (Lepidoptera Tineidæ). This belongs to the genus *Agdistes* of Hübner; and his *Agdistes adactylus* is *Adactylus Hübneri* of Curtis. Pl. 472. *Smiera Macleanii*, (Hymenoptera Chalcididæ). This is the *Chalcis melanaris* of Dalman. Pl. 473. *Drosophila cameraria*, (Diptera Muscidæ); 474. *Hallomenus flexuosus*, (Coleoptera Helopiidæ); 475. *Ophiusa lusoria*, (Lepidoptera Noctuidæ); 476. *Leiophron apicalis*, (Hymenoptera Ichneumonidæ); 477. *Tachydromia arrogans*, (Diptera Tachydromiidæ); 478. *Synodendron cylindricum*, (Coleoptera Lucanidæ); 479. *Gracillaria anastomosis*, (Lepidoptera Tineidæ); 480. *Oxybelus argentatus*, (Hymenoptera Larridæ); 481. *Lygæus equestris*, (Hemiptera Coreidæ).

We may remark, that some of his figures are much too highly coloured.

2. *Stephens's British Entomology*. No. 59. — This Number is devoted to the *Staphylinidæ*, and has two Plates, one of Coleoptera, the other of Diptera.

3. *Magazine of Natural History*. No. 35.—“ A Notice of the Ravages of the Cane-fly, a small-winged Insect, including some Facts on its Habits; by a Subscriber in Grenada: with additional Observations by J. O. Westwood, Esq. F.L.S.” &c. Mr. Westwood gives it the name of *Delphax Saccharivora*, and compiles from Kirby, Spence, &c., an account of some of the Insects supposed to be injurious to the sugar-cane.—“ An interesting Account of the Economy of a Species of *Ichneumon*, by Mr. E. W. Lewis; communicated by Mr. Westwood:” also, “ Descriptions of Genera of Parasitic Hymenoptera, by Mr. Westwood:”—*Epicopterus*, *Smaragdites*, *Closterocerus*, *Cephalonomia*, and *Epimeces*.

No. 36. Mr. Westwood on the *Cynipidæ*, with descriptions of some Hymenopterous genera: three new—*Cerapterocerus*, *Derostenus*, and *Myrmecomorphus*. We are acquainted with no essay, by Mr. Haliday, in which he uses the terms *propes*, or *metapes*, or *metala*. In our Magazine, and in the Zoological Journal, he always writes *pes-anticus*, or *posticus*, and *ala postica*, or *inferior*:—like Meigen, he uses *metatarsus anticus* or *posticus* for the basal joint of the anterior or posterior tarsi.

Mr. Westwood proposes to term the anterior wings *mesalæ*!—and to substitute *medi-* and *post-thorax* for *meso-* and *metathorax*!

4. *Recherches Anatomiques et Physiologiques sur les Hémiptères, accompagnées de Considérations relatives à l'Histoire Naturelle et à la Classification de ces Insectes; par M. Léon Dufour. Paris, 1833.*—An elaborate essay on the internal anatomy of the Hemiptera, accompanied by a great many figures: we have no room for details.

5. *Annulosa Javanica, ou Description des Insectes de Java, par M. W. S. MacLeay, Esq.; précédés d'un Extrait des Horæ Entomologicæ du même Auteur. Paris, 1833.*—MacLeay's *Annulosa Javanica*, and the systematic part of his *Horæ Entomologicæ*, together with several of the plates in both works, are republished in this volume.

6. *Genera et Species Curculionidum, cum Synonymia hujus familiæ; a C. J. Schoenherr. Species novæ aut hactenus minus cognitæ, Descriptionibus a Dom. Leonardo Gyllenhal, C. H. Boheman, et Entomologis aliis illustratæ. Tomus 1^{us}. Pars 1^{ma}. et 2^a. Parisiis, 1833.*—Most entomologists must be acquainted with Schoenherr's Classification of the Curculionidæ, published some years back. We observe very few alterations in the systematic arrangement of this new edition; however, the number of species is considerably increased, and many subgenera are raised to the rank of genera. About three hundred genera, besides subgenera, which he terms *Greges*, are classified; and the species ranged under these genera amount to upwards of three thousand. They are divided into two great groups; the *Orthoceri*, with straight antennæ; and the *Gonatoceri*, with bent antennæ. The characters of some of the species extend nearly over a page, and are too long.

7. *Annales de la Société Entomologique de France. Tome II., Trimestre III., Paris, 1833.*—This number contains several valuable papers: among others,—1. "On the Mouth of *Libellulidæ*, by M. Aug. Brullé." The author remarks, that, in predacious insects, the palpi attain their greatest development; and he considers them to be organs of prehension.

The *Libellulidæ* have their labial palpi very much developed; the maxillary are almost obsolete. 2. "Physiological Considerations on the Development of Instinct in *Invertebrata*, by M. Fray."—Insects are placed by this writer in a much higher rank among beings than they are generally considered to occupy; and he allows them to possess the faculty of thinking. 3. "On the Habits of the *Papilionidæ* of French Guiana, by M. Th. Lacordaire."—In this interesting paper are described the various flights of those charming creatures: the *Morphos* soaring majestically above the summits of the loftiest trees; other *Morphos*, flying by irregular and rapid bounds of eight or ten paces each; the immense *Pavoniæ*, half-nocturnal, flapping their wings heavily during their short flight, &c. &c. 4. "Mémoire sur une Nouvelle Classification des Aranéïdes, par M. le Baron de Walckenaer."—His works on this tribe are well known; and to him alone are we indebted for almost all we know of their systematic arrangement. His systematic table is excellent: the genera are placed in the middle; on the one side, he divides them according to their external structure; on the other, according to their natural habits.

8. *Révue Entomologique, publiée par Gustave Silbermann. Strasbourg. Tome I., Livraisons 1—5.*

9. *Magasin de Zoologie; par F. E. Guérin.*—The principal essays published in this work since we last noticed it, are:—

1. "On the Exterior Organization of *Phyllosoma*, with a Monograph of that Genus, by F. E. Guérin."—This is an elegant genus of *Crustacea*, found in all the tropical seas; the species are transparent like glass; and when swimming can only be distinguished by their beautiful blue eyes. 2. "A Monograph on the Genus *Raphidia*, with Figures of the Larva and Pupa, by M. Percheron."—In their metamorphose they resemble the Coleoptera; and the pupa is quiescent, not active, as it has been generally supposed to be.

10. *Iconographie du Règne Animal de M. le Bⁿ. Cuvier; par M. F. E. Guérin. Livraisons 31—33.*—These contain seven entomological plates; five of Coleoptera, and two of Hymenoptera.

11. *Iconographie, &c. des Coléoptères d'Europe; par M. le Comte Dejean, et M. le Docteur J. A. Boisduval. Tome III., Livraisons 6 et 7.*—Containing the genera *Stomis*, *Abaris*, *Rathymus*, *Pelor*, *Zabrus*, and part of *Amara*.

12. *Die Arachniden. Getreu nach der Natur abgebildet und beschrieben von D. Carl. Wilh. Hahn.; Erster Band. Fünftes Heft.* 1833.

13. *Icones Historique des Lépidoptères d'Europe, nouveaux ou peu connus; par le Docteur Boisduval. Livraisons 1—18. Paris.*—Each number (of which there will be about twenty-five when the work is finished) contains two plates, and the figures are true to nature, and very highly finished.

14. *Collection Iconographique et Historique des Chenilles d'Europe, avec l'Histoire de leurs Metamorphoses, et des Applications à l'Agriculture; par le Docteur Boisduval, P. Rambur, D. M., et A. Graslín. Livraisons 1—18. Paris.*—All the caterpillars (figured with the plants on which they are found) are designed with much spirit and elegance. — Works like this should be encouraged, as they show how the study of entomology may be rendered useful to agriculture and the manufactures.

15. *Iconographie et Histoire des Lépidoptères et des Chenilles de l'Amérique Septentrionale; par Boisduval et Leconte, &c. Livraisons 1—10. Paris.*

16. *Brasilien's vorzüglich lästige Insecten, von Dr. I. Pohl und V. Kollar, &c. Wien, 1832.*—In this work are described and figured, many of the noxious and venomous insects of Brazil, such as scorpions, termites, ants, mosquitos, &c.

17. *List of Hübner's Works:—*

(1.) *Histoire des Papillons d'Europe (les Chenilles); recueillis par J. Hübner, à Augsbourg, 1806.*

(2.) *Collection de Papillons d'Europe, &c. 1805.*

(3.) *Collection de Papillons Exotiques, 1806.*

(4.) *Supplément à la Collection de Papillons Exotiques, &c. 1818.*

(5.) *Catalogue des Papillons connus.*

(6.) *Catalogue Alphabétique et Systématique des Papillons formant la Collection d'Europe.*

The four first are still publishing. They may be had on application to Charles Geyer, the continuer and editor of Hübner's works.

18. *Osservazioni sopra la Sphinx Atropos o farfalla a testa di morto del Dottore Carlo Passerini. Pisa, 1828.*

19. *Osservazioni e Notizie relative alle Larve pregiudice voli alla punta del gran Turco del Dottore Carlo Passerini.*

20. *Osservazioni sub baco danneggiatore delle ulive e sulla mosca in cui si transforma del Dottore Carlo Passerini.*

21. *Osservazioni sopra alcune Larve e tignole dell' ulivo del Dottore Carlo Passerini.*

22. *Nova Acta Physico-Medica, &c. 1832, cont.*

Monographia generis Meloës, auctoribus Bradt et Erichson.

Über Entwicklung der fusslosen Hymenopteren Larven, mit besonderer Rücksicht auf die Gattung Formica. F.D.C. Ratzeburg.

23. *Neuere Beiträge zur Schmetterlingskunde mit Abbildungen nach der Natur. Herausgegeben von C. F. Freyer. Mit 6 illuminirten Kupfertafeln. 1—16 Hefte. Augsburg. 1831—1833.*

The observations at page 450, line 25 of Vol I. in our review of Vol. XVI. Part III. of the Linnæan Transactions, are erroneous on our part: we could explain how it occurred, but prefer merely apologizing to our readers for having misrepresented a fact, and assuring them, that it was quite unintentional. We are liable as others to make mistakes, but we are ever ready to acknowledge them when pointed out. A commendatory observation on this article has reached us, by which we feel highly flattered.

Twenty-seven written communications have reached us, directly or indirectly, on the subject of our review of British Entomology,—twenty-five are commendatory; two condemnatory: one of these, complaining of the severity of the review, but admitting the strength of our ground; the other from Mr. Dale, disapproving of the manner and matter.

ART. IX.—*Varieties.*

1. *Note on Dryophilus Anobioides*.—In the first part of M. Guérin's *Magasin de Zoologie*, a small Ptinideous beetle is figured and described by M. Chevrolat, under the name of *Dryophilus anobioides*, nearly allied to *Anobium*; but which, as to its generic characters, differs from that genus in the great elongation and slenderness of the three terminal joints of the antennæ. In this figure I recognized an insect which I had captured ten years ago in the neighbourhood of London, and had presented to Mr. Haworth, in whose collection it remained unnoticed, and which that gentleman and myself had deemed to be a new genus, distinct from *Anobium*.

In the spring of the present year, the Rev. G. T. Rudd was fortunate enough to capture this species again upon the Broom at Coombe Wood; and having been so kind as to give me a specimen, I carefully examined it with the original specimen, with which it was found exactly to correspond, except in the terminal joints of the antennæ; whence it was evident that the two individuals were of opposite sexes, and that M. Chevrolat's figure and description were taken from a male, the female being unknown to him. It was evident, also, from these specimens perfectly agreeing in form, sculpture, and with M. Chevrolat's, that his figure of the antennæ (for want of comparison of the length of these organs in the sexes) represented them rather too long in the terminal joints.

In the English specimens, the ninth joint of the antennæ in the males is at least as long as all the eight preceding; the tenth, a little shorter; and the terminal joint, still rather shorter. These three joints, instead of being dilated at the tips on the inside, are of equal breadth throughout, the base only of each being slightly narrowed. In the female, on the

contrary, the ninth joint is not longer than the five preceding joints together; the tenth is shorter, but the eleventh is as long as the ninth.

The *Anobium pusillum* of Gyllenhal seems to be very nearly allied to the preceding species, appearing to differ in its small size, ("Cryptophago cellari fere minus, angustius,") black colour; (the legs and antennæ being however obscurely ferrugineous, as in the English specimens;) and habitat "in frondibus Abietis."

From what has been observed respecting the variation in the length of the terminal joints of the antennæ in the sexes, taken in connexion with the peculiarities observable in the antennæ of other species, it is evident, either that the genus *Dryophilus* (established chiefly upon the great length of these terminal joints) must sink into *Anobium*, or that some other species of the latter genus must be introduced into it, or must be formed into sectional divisions of at least equal value with it.

In the *typical species* of *Anobium*, the last three joints of the antennæ are comparatively short, compressed, and gradually widened towards the tip, scarcely any difference being observable in the sexes. In *Anob. castaneum* they are less incrassated; in *Anob. abietinum*, the antennæ of the males are "*longitudine corporis*" with the *intermediate joints gradually elongated, so that the ninth joint is scarcely longer than the eighth*; the two terminal joints are however longer, but scarcely thickened. In the female these organs are shorter, and the three last joints broader, than in the males; the intermediate ones being also longer than in the other species; whilst, in *Anob. molle*, the males have antennæ about half the length of the body, very slender, the intermedial joints longer than in the true *Anobia*; the three last joints not thicker than the preceding, and occupying about half the entire length of the whole antennæ. In the females, the last three joints are shorter and more thickened.

P.S. to the Notice of Dryophilus.—Since the above observations were written, Dejean has published the second part of his *Catal. des Coléopt.*, second edition; in which he gives *Dryoph. anobioides* as an *anobium*, considering it at the same time as synonymous with the *Anobium pusillum*, noticed above.

J. O. WESTWOOD.

2. *Note on Clytus Arietis*.—SIR, On the 22d of this present month, (May 1833), I observed three specimens of *Clytus Arietis* crawling about in one of the cases of birds in our museum, which appeared to have just emerged from the pupa. I examined the case narrowly, and the oak-branches upon which the birds are placed, but could not perceive any aperture from which they had made their escape, although it is evident they have passed through their metamorphosis in some of the stumps. The cases have been put up nearly five years, and the last branches I put in were procured in May 1830; and, to prevent the appearance of any insects, I had them all well dried over a stove, and in a drying-house attached to a stuff-presser's shop.

Whether *Clytus* is always three years in arriving at maturity, I am not aware; if such is the case, then my discovery is of *little moment*, except the proof of their surviving the high temperature to which they were exposed.

I am, dear Sir, Yours truly,

A. H. DAVIS, Esq.

HENRY DENNY.

3. *Note on Cynthia Cardui*.—Every entomologist is aware of the irregular appearance of the above-named insect; some seasons scarcely a specimen is to be met with, and at others they abound over the greater part of the country; but on Tuesday, October 8th, their numbers in the neighbourhood of Tooting by far surpassed any thing of the kind I ever witnessed, particularly in the nursery of Messrs. Rollison and Sons: it was highly delightful to behold those lovely insects, sporting from flower to flower, in every part of the garden,—but the *Dahlia* seemed to be their favourite plant. I cannot but suspect those insects to have migrated from some other part of the country; for, previous to that day, I had not seen a single specimen in the neighbourhood, and but a very few since:—again, it was evident, they must have been “winging their way” for some time, as most of them were in a faded condition.

Oct. 18, 1833.

C. WOOD.

4. *Editorial Criticisms*.—SIR, It is with feelings of regret and mortification, that I perceive, from a late prospectus, that your admirable Magazine has not met with that success it so

highly deserves. If what has been asserted by Professor Babbage, and repeated by myself, on the state of science in this country, required any additional proof, a more convincing one than this fact could not be adduced. I need hardly advert to those numerous papers in the volume before us, which demand the attention of all who wish to extend the present boundaries of our charming science; while the tone of high and manly feeling, alike free from intemperate abuse or caustic censure, — yet independent and uncompromising, — *must be congenial to every honest and honourable mind*. Could we bring men but to govern themselves by such feelings as pervade the editorial notes to which I more particularly allude, the regions of science would be the fabled Utopia. But, alas, naturalists are but men! — and he who affects surprise, that perfect unity of sentiment and congeniality of feeling does not pervade among its votaries, has yet to learn that unworthy passions can never coalesce with those that are good. Judgment, temperance, and moderation, joined with inflexible firmness and impartiality, in the defence or assertion of truth, are more particularly expected from editors; and these essential qualifications, in my judgment, are eminently conspicuous in the *Entomological Journal*. I beg you will, in future, consider me as an annual subscriber for five copies; and I feel confident that many others will use their utmost endeavours to render the continuation of the journal a matter of *certainly*. I should be happy, indeed, if any contributions from my pen, during the short intervals of leisure I possess, might be thought acceptable: — but my views on the natural arrangement of the *Annulosa*, (and consequently of *all* the subordinate divisions,) are so totally different from all the modern-received notions on this subject, that I cannot suppose they would, *at present*, be listened to with patience, much less with approbation; and I should have neither time nor inclination to defend them.

I am yours, &c.

WILLIAM SWAINSON.

[We feel highly gratified by Mr. Swainson's good opinion. Alas, that plain, honest, impartial criticism, should be of so rare occurrence as to call forth such lavish praise! — ED.]

5. On *Cheiropachus pulchellus*. — SIR, Being professionally engaged in the neighbourhood of Newmarket during the

month of June 1832, I now and then indulged in a little of my favourite pursuit—Entomology. On one occasion, I found a fir-pole much perforated by some *Xylophagous* insect: on the surface of this pole were several specimens of *Cheiopachus pulchellus* (Walker's MS.), busily employed in examining, and occasionally inserting their abdomens into these perforations. The *Cheiopachus* I first secured, and then immediately commenced stripping this pole of its bark; under which I found *Hylurgus piniperda* in all stages of existence, from the larvæ, some of which were very small, to the perfect insect.

I therefore have reason to believe, from these circumstances, and observations I made some time back on another species (*Quadrum*) of this genus, that they are parasites on the genus *Hylurgus*.

It is singular that, on examination, I found all my specimens of the *Cheiopachus* males, except one; though, from the way in which they were employed, I should have suspected they would have proved to be the opposite sex.

A. COOPER.

Nov. 27, 1833.

6. *Capture of Sphinx Neri*. — SIR, Having read in your valuable Magazine for last October a communication from Mr. Stephens of the capture of the *Sphinx Neri* at Dover, last autumn, I have much pleasure in being able to inform you, that it most decidedly is a British insect. A fine larva of that moth was taken in a lady's garden at Teignmouth, Devon, in August 1832, and communicated to me by Mrs. Tayleur, an entomological friend of mine there, accompanied by a highly-finished coloured drawing of the same, taken from life. But unfortunately it died in a few days after its capture, from the injuries it received from the person who brought it to my friend under the erroneous impression of its being venomous. The perriwinkle is abundant in the garden where the larva was found: it is therefore a natural supposition, (as expressed by a writer in the Natural History Magazine for March 1832), "that it may resort to the *Vinca major* and *minor*, or some species of that tribe, as a substitute for the *Oleander*, which requires protection from the severity of the winter in many

parts of the continent, where the *S. verii* is found, and therefore cannot be the *constant* food of that insect.

I remain, &c.

Yours, truly,

CHARLES BLOMER.

24, Burton Crescent, October, 1833.

[We are much obliged for the beautiful drawing which accompanied this communication: we hope to obtain the loan of the perfect insect; if so, we purpose giving a plate of them together.—ED.]

7. *List of a few Insects observed in Devonshire and Cornwall during the Month of September, 1833.*—*Drypta emarginata*; under a stone on the lias, near Lyme Regis, Dorsetshire. — *Cicindela Germanica*; in the same situation. — *Cafius fucicola*; near Plymouth, under sea-weed, with *Cafius lateralis*, in the proportion of one to about fifty. — *Methoca ichneumonoides*; on chalk-marl, and green sand, near Lyme Regis. — *Pentatoma pusillum*, Schäffer; Cornwall. — *Chironomus æstivus*; in a wood near Linton, Devonshire. — *Orphenephila devia*; on damp herbage, growing at the base of the cliffs by the sea-shore at Teignmouth and Sidmouth. — *Drapetis aterrima*; on *fuci* near Penzance, Cornwall. — *Miltogramma punctata*; near the Lizard Point, Cornwall. — *Testanocera marginata*; near Penzance, Cornwall. — *Agonum micans*; near Exeter. — *Tachydromia arenaria* was very abundant near Plymouth and Torquay, running with great rapidity over the rocks, a little above high-water-mark; its wings are very short; and its flight resembles a succession of leaps, each not exceeding two or three inches;—some (perhaps a distinct species) have ample wings; it forms a new genus, nearly allied to *Drapetis*, as Mr. Haliday remarked. — *Platymischus dilatatus* swarms on the rocks, and among the sea-weed, near Plymouth; I found it also near Torquay, but there it was much less common. It moves slowly, like the *Psili*, and varies very much in size. At Torquay it was accompanied by a *Psilus*^a and a *Figites*.^b The former was rather scarce; the

^a *Psilus fucicola*. Mas et Fem. *Ater, nitidus*: antennæ articulo 1^o. basi rufo; maris moniliformes, nod. pilosæ; fem. clavata: pedes picei, tibiis tarsisque basi rufis: alæ angustæ, subfuscæ, apice ciliatæ. (Corp. long. $\frac{3}{4}$ —1 lin.; alar. $\frac{3}{4}$ —1 $\frac{1}{2}$ lin.)

^b *Figites subapterus*. Mas et Fem. *Ater, nitidus*: maris antennæ filiformes, corpore longiores; fem. multò breviores, subclavata: pedes castanei; femora fusca; protibia apice spina armata: alæ perbreves. (Corp. long. $\frac{3}{4}$ —1 lin.)

latter, which was more abundant than the *Platynischus*, runs very fast; and, when touched, contracts its antennæ and legs, and lets itself fall from the rocks. At Plymouth it was much rarer; I saw only one or two specimens.

F. WALKER.

8. *Chrysomela graminis*.—SIR, This insect appears to be double-brooded: I find it in a wet place near this city (Bath), upon the *Mentha hirsuta*, to which plant it appears very strictly to confine itself, in the middle of June and the beginning of September. It is in great plenty at both the above times; but I do not remember finding a single individual during the intervening months. My friend, the Rev. F. Lockey, observes, that in the autumn it feeds upon the flowers of the *Mentha* in preference to the leaves.

C. C. BABINGTON.

9. *Cardiapus Mathewsii*.—I found this insect in great plenty (taking more than forty specimens,) on the *Cistus Helianthemum*, at the top of the Gogmagog Hills, near Cambridge, on the 4th of last July, and also on the same plant, but in smaller quantity, at the Devil's Ditch, Newmarket Heath, on the 2d of that month; at both these places many other specimens were also taken.

Yours, &c.

C. C. BABINGTON.

Bath, Nov. 5, 1833.

10. *Ignis Fatuus*.—The *supposition*, that the *Ignis fatuus* is caused by the light emitted by some *insect* has, I believe, among scientific men, long yielded to the *known fact*, that it is merely the combustion of gaseous matter. In a very interesting paper upon this subject in a former number of your Magazine, the facts and experiments related prove this latter theory beyond doubt; but the writer leaves us in the dark as to the nature of the gas to which the phenomenon is attributable.

This gas, however, I believe, is generally supposed to be phosphuretted hydrogen, a combination of phosphorus and hydrogen gas, which spontaneously ignites upon coming in contact with atmospheric air. Should any of your readers feel inclined to illustrate this by actual experiment, or to view

the phenomenon of the Will o' the Wisp by their own firesides, it may be easily done by the following method :—Into a tumbler or any other vessel filled with water, drop a few small pieces of phosphuret of lime ; the water will be in part decomposed ; and the phosphorus combining with the hydrogen, will form phosphuretted hydrogen gas ; bubbles of which will be seen rising to the surface, where they will immediately inflame upon coming in contact with the air, and exhibit a pale and somewhat ghastly flame ; should an inverted jar of oxygen be held over the water, the bubbles will in like manner inflame, but with a light which is most dazzlingly brilliant. The intensity of the light of the flame, therefore, it would appear, depends upon the quantity of oxygen contained in the atmosphere to which it is exposed ; and it would of course follow that in bogs, and other damp places, where the air is impure and its comparative quantity of oxygen but small, the flame would be so faint as to be scarcely visible in day-light, though perfectly apparent at night.

Phosphorus forming one of the component parts of all animal and vegetable matter, it is obvious, that in the course of the decomposition of such matter it must be set at liberty in considerable quantities, when, combining with the hydrogen of the water of the surrounding soil, it forms the gas, which, making its way to the surface of the earth or water, as the case may be, ignites immediately it comes in contact with the atmospheric air, and thus forms in church-yards, morasses, and other damp places, the phenomenon which has caused the heart of many a stout yeoman to beat with superstitious awe.

R. A. OGILVIE.

11. *Aleyrodes Phillyreæ*.—About the end of May I found the different species of *Phillyrea*, particularly the *media* and *latifolia*, in gardens near Dublin, swarming with this pretty species. They covered the under sides of the new leaves, from four to a dozen sitting under each ; and the leaves of the former year were equally loaded with their puparia, from which they seemed to have just emerged. The lower surface of the young leaves was whitened with their powder and strewed with eggs, scattered irregularly, and not in patches : these are transparent when laid, soon become wax-coloured, and in a few days opaque, glossy, pearl-grey. They are much longer in the

hatching than those of *A. Chelidonii*, as recorded by Réaumur, for not a tenth of them had produced the scale-like larvæ when I examined the trees nearly a month later. Having left that part of the country soon after, I did not ascertain whether there is more than one brood in the year. The perfect insect measures about $1\frac{1}{2}$ line across the wings expanded; the body is pale yellow, but the head, thorax, antennæ and legs covered with white powder; the tip of the sucker dusky, the eyes black; the hinder segments of the abdomen above, and the borer of the female, are greyish. The wings pearly-white, and covered with white powder: in old specimens only there is a duller reflection in the usual places near the base and end of the principal nervure; but even there it is very obscure, and disappears if the light is dispersed by a lens of moderate power.^a

A. H. HALIDAY.

12. *Insects attracted by the offensive Smell of a Flower.*—In July 1832, I had four very luxuriant blossoms on a plant of *Arum Dracunculæ*, the Dragon Arum, the smell of which is, perhaps, the most offensive of any plant with which we are acquainted; in the present instance, it was so much so as to attract numbers of those insects whose food consists of putrid substances; these must certainly have been deceived by the scent, which they mistook for that of their natural food, for in no instance did they eat any part of the flower, but, falling down the smooth sides of the corolla, slipt into the cup, and there perished. On examining the cups after the flowers had faded, they contained the following insects:—*Staphylinus maxillosus*, *Philonthus*, six species; *Hister*, three species; *Nitidula bipunctata*, *grisea*, and two others; *Scatophaga*, three species; *Musca vomitoria*, *Cæsar*, *thalassina*, *Lanio*, *maculata*, and three others; *Anthomyia lardaria*; and *Helophorus griseus*.

EDWARD NEWMAN.

^a I examined *Chelidonium majus* in several gardens of the neighbourhood, but did not meet with *Al. Chelidonii*. The other, flying round the Phillyrea trees, lights on the passers by and on the neighbouring shrubs, but I did not find either egg or puparium on trees of any other genus.

THE
ENTOMOLOGICAL MAGAZINE.

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ART. X. — *Abstract of M. Straus-Dürckheim's "Considerations Générales sur l'Anatomie Comparée des Animaux Articulés."* By EDWARD DOUBLEDAY, ESQ. M. E. S.

(Continued from Vol. I. page 479.)

"Non eram nescius ut hic noster labor in varias reprehensiones incurreret, si delectamur cum scribimus, quis est tam invidus qui ab eâ nos abducatur? ; sin autem laboramus, quis est qui alienæ modum statuat industriæ?"—CICERO.

PART II.—MUSCULAR SYSTEM.

Muscles in General.

IN the *Annulosa* and *Annelida*, the muscles are composed, like those of vertebrated animals, of two parts; the one, the muscle properly so called, which is contractile; the other, the tendon, not contractile. But, as we cannot separate these parts without destroying the muscle, it becomes necessary to describe them together: some general remarks may nevertheless first be made upon each separately.

Tendons.

The tendons of *articulated* animals possess a greater degree of solidity than those of *Vertebrata*. This is owing to the presence of a larger proportion of calcareous matter: they differ but little from the internal *apophyses* of the integuments, except in the direction of their fibres, which is always either longitudinal or radiating, according to the form of the tendon; they are also of a closer texture.

In general, they augment in thickness a little before their insertion; but as, notwithstanding their solidity, they require to be moveable upon the piece they put in motion, the larger ones offer, near their extremity, a small flexible narrowed portion, resembling an articulation. They are generally simple at their extremity, but sometimes bifurcate, as the *flexor tibiæ* in the genus *Limulus*.

Muscles.

The muscles of insects, and in general of all the *Annulosa* and *Annelida*, differ from those of *Vertebrata*, in being of a less firm consistence. Indeed, they are sometimes in a gelatinous and almost transparent state; and it is only by being steeped in alcohol, or some other liquid,^a that they acquire a sufficient degree of opacity and firmness to enable us to distinguish their form; yet their power surpasses that of the muscles of larger animals.

They are composed of a multitude of fibres, in which the power of contraction resides, and which are mostly straight, and separate one from another, but are sometimes united in bundles which rarely are connected.

The fibres are composed of small, nearly triangular plates, placed obliquely one upon another. These plates are nearly flat; but one of the sides is produced so as to form an angular fold in the middle of the plate, which gradually diminishes until it ceases, just before reaching the opposite margin.

In the *Vertebrata* the muscles often have a tendinous origin, or offer a tendinous portion in the middle (as the *digastricus*, &c. in man). This is very rarely the case in the articulated animals.

The solid cupules, to which the extremities of some muscles are attached, appear to be the analogues of the *aponeuroses*^b of *Vertebrata*; they are generally found at the origin of the long tendons, but sometimes both ends of a muscle are furnished with them.

^a I have always found alcohol, mixed with a small portion of acetic acid, the best mixture for giving firmness to the internal parts of insects. They should, however, be well washed with pure alcohol afterwards, or the acid will ruin the knives or scissors used in dissecting.—E. D.

^b *Aponeuroses* are the expanded parts of the tendons which cover the muscles, give insertion to their fibres, strengthen their action, and restrain them in their proper places.—E. D.

Those muscles which pass directly from one part to another without the intervention of tendons, are mostly pyramidal or cylindrical, according to the form of the parts to which they are attached. Those which have tendons are either *conical*, *pyramidal*, *pseudo-penniform*; that is, flat, triangular, with the fibres arising from the same line, and attached to one or both sides of a flat tendon,—*penniform*, where the fibres, not arising from the same line, give the muscle a wedge-shaped and notched appearance,—or *compound*, that is, formed of several heads, which are each furnished with a tendon, these tendons before their insertion uniting into one.

One remarkable circumstance in the organization of insects is, that many muscles have their origin from, and are inserted into, two perfectly moveable parts of a quite different nature. These are not merely muscles, which move parts forming a series, as the *vertebræ* of the higher animals, or the segments of the *abdomen* in insects; *these* are muscles which move certain parts with relation to *one another*; but those to which we refer move the parts in relation to the *trunk*, the fixed part of the body, yet arise from parts equally moveable, and of a quite different function. In the *Coleoptera*, and also in not a few other insects, many very powerful muscles are thus situated. Such is the *extensor posticus alæ*, which is at the same time the *extensor coxæ metapedis*.

Observation proves that, in the *Articulata*, the presence, volume, and even the form of the muscles, depend solely on the function of the part they move. Hence it arises, that when, in any species, a part loses its power of motion, without undergoing any other change, the muscles usually inserted thereto disappear to yield place to more important organs; and when a part changes its form or function, we find the muscles inserted into it equally vary in volume, and even in their disposition to accommodate themselves to the new function: a simple modification in the articulation of the moveable part sometimes varying its motions very considerably, the muscles inserted into it are modified in consequence of this change. Lastly; it may happen, that the piece to be put in motion varies its functions; the muscles also change theirs.

Moreover, observation proves, that the parts from which the muscles *arise*, may vary much in form and size without the muscles being at all influenced thereby; and that analogous

muscles do not always arise in different species from the same part.

From these facts it may be inferred, that although the tegumentary and muscular systems are mutually dependent one upon the other, there may exist a considerable difference between the modifications which these systems undergo as compared with one another. This difference is often very considerable; for it is hardly possible to recognize the analogous muscles in two species taken even from neighbouring families, unless we trace them through the greater proportion of the intermediate genera; and as no species can be looked upon as a type for the whole division, it is impossible to refer the muscles of one species to their analogues in another, taken from a different division.

Notwithstanding these variations, it is possible, by avoiding details, to lay down a few general rules.

In the *Annelida*, *Myriapoda*, and the *larvæ* of insects, we mostly find two principal orders of muscles, forming, the one, a double series along the upper, the other, a like series along the lower, part of the segments, passing from one of these to another. We find these same series more or less modified in the perfect insect: the lower series have become the muscles which move the *labium*, the depressors of the head, the retractors of the jugular pieces, the inferior retractors of the *prothorax*, the prætractors of the posterior episternal *apophysis*, the inferior prætractors of the segments of the *abdomen*; but those muscles which move the head, and three thoracic segments, are changed considerably as to form, volume, and disposition, whilst those which move the segments of the *abdomen*, disappear whenever these segments become fixed. In like manner the longitudinal dorsal series form the elevators of the *labrum* and head, the superior retractors of the *prothorax*, the retractors of the wings and *scutellum*, the depressors and prætractors of the wings, and the superior prætractors of the abdominal segments. The upper part of the segment to which the jugulars belong having disappeared, the muscles, which would otherwise be inserted therein, proceed direct from the *scutellum* to the head, forming the second heads of its elevators. We find also in perfect insects some of those muscles, which, in the *larvæ* of insects as well as in the *Scolopendræ*, pass from the *tergum* of the *prothorax* to the *sternum*; but, in

many cases, these muscles disappear. The muscles contained in the *femur* and *tibia* differ but little in all the articulated animals with solid integuments. In Insects, the muscles placed in the joints of the *tarsi* disappear, and they are all moved by one muscle placed in the *femur* or *tibia*; the tendon of which traverses the *tarsus* to be inserted in the claw. Where the articulation of the parts of the legs is ginglymoidal, they are commonly moved by only one pair of muscles; where the articulation allows the parts to *roll*, they are generally furnished with more. But the muscles which move the *coxa* and *trochanter* vary much in form, number, composition, and insertion. The *flexors* of the *trochanters* are generally simple and penniform, whilst the *extensors* are mostly formed by several heads, one at least of which has its origin in one of the thoracic segments, the others generally in the *coxa*.

PART. III.—DIGESTIVE ORGANS.

Organs of Manducation and Alimentary Canal.

The digestive organs bear a constant relation to the quality of the food destined for the support of the animal, or at least are not incompatible therewith in form or disposition. But the food being so much modified in its properties by the action of the parts of the mouth, the intestinal canal is liable to be acted on by so few of these, that their influence is scarcely felt by it. Hence it follows, that the form of the parts of the mouth must depend more particularly on the quality of the food, and be more precisely in relation with organs which (as the feet) concur indirectly to the function of digestion. This is confirmed by observation: but the intestinal canal is found to offer a much less uniform relationship with the food and with the other organs.

That the parts of the mouth are less subordinate to the quality of the food in the *Annulosa* than in the *Vertebrata* has already been pointed out: they differ considerably in their form where the food scarcely varies, and *vice versâ*. Nature, always so admirable in all that she produces, shows us here, as often elsewhere, that she is not constrained servilely to confine herself to the use of one sole means; but, on the

contrary, how great are her resources, and what profound wisdom does she exhibit in varying and combining them without ever creating any thing which is not in the most perfect harmony!

The differences which we have been remarking are principally due to the gradation in structure of the digestive organs, and the anomalies they present, which are often only apparent, depend on causes unconnected with the digestive system, as, for instance, the self-defence or industry of the animal.

The food influencing most powerfully the parts of the mouth, these must be considered as governing all the other parts of the digestive system, and, consequently, they become highly important for the purposes of classification, especially as relates to genera and families. It may be added, that the gradation to which the parts of the mouth are subjected, proceeds nearly *pari passu* with that of the other organs to which we can attach importance in classification, although their reciprocal dependence is often very slight: such is the gradation to which the wings are subject in insects.

The skeleton of the *Vertebrata* being replaced in the *Annulosa* and *Annelida* by the integuments, the masticatory organs of the former have also disappeared, and are replaced by parts belonging to the tegumentary system.

In the genus *Lumbricus*, where the integuments are membranaceous, the mouth is a simple orifice of the intestinal canal, scarcely differing from the *anus*; hence these animals can merely swallow their food without masticating it. In the leech (*Hirudo*), which is higher in its organization than the earthworm, we find three fleshy jaws furnished with corneous teeth, which form a sort of saw enabling them to cut the skin of animals. This form of mouth, of which we find the first trace in this genus, becomes more developed in the still more perfectly formed genus *Eunice*, where we find four pair of jaws, of a different form and very strong, fixed in the mucous membrane of the *pharynx*. In the *Annulosa*, as we have already remarked, the *trophæ* are but the anterior feet transformed, and serving more directly for the purposes of digestion than the others. The jaws analogous to those of *Eunice* appear to be wanting, but most probably they are represented by the gastric teeth of *Crustacea*. In tracing the development of

these organs in the *Annelida*, we find their situation gradually becoming lower down in the alimentary canal, to acquire that disposition they present in *Crustacea* and Insects. In *Nephtys* and other genera, the jaws are placed at the lower part of the *œsophagus*, which reverses itself in the form of a *proboscis* when the animal wishes to feed. In comparing the jaws of the *Annelida* to the organs of the mouth and stomach of the *Annulosa*, we find them, both as to form and disposition, more analogous to the gastric than the oral jaws of the latter.

The transformation of the first pair of feet into maxillæ is very evident in the *Scolopendræ*, but it is not so with respect to the *labium* and mandibles : perhaps there exists some species as yet unknown, which may afford us a proof of a similar change in these also.

The *Crustacea* have from two to six pairs of jaws, the posterior pairs in many closely resembling the feet, proving indubitably that the organs of the mouth are but these last modified. The strength of the mandibles, and the size and number of the maxillæ, show that these animals subsist on solid food; but the nature of this is not always clearly marked by the form of the jaws, though in general the carnivorous species have them toothed, the herbivorous merely incisive. In the parasitical *Crustacea* (*Nymphon*, *Phoxichilus*, &c.) the mouth, though formed on the same plan as that of the other *Crustacea*, is smaller and much less developed; hence these animals subsist by sucking the blood of other animals (generally the *Cetacea*) instead of solid food. All the *Arachnida* (*Arachnida* and *Acaridea*) are very rapacious, but the parts of the mouth offer a striking difference in form, the larger species (the *Arachnida*, MacLeay), which prey on insects, having them very robust, but suited more to their habits of sucking their prey than to the purposes of manducation, whilst in the smaller (*Acaridea*, MacLeay), which are mostly parasitical, they are commonly formed into a simple *haustellum*. Some however of these, as the *Acari*, which feed on dry animal and vegetable substances, are masticators.

The development of the mouth attains its greatest degree of perfection in the *Coleoptera*, and we can, with some few exceptions, determine the nature of their food from the form of the *trophi*. Those which *prey on living animals* have the mandibles slender, and projecting beyond the *labrum* about

one-third of their length; they have no molar surface or incisive edge, but are furnished with a few rounded teeth, and terminate in a sharp incurved point; moreover, they are very moveable. The *maxillæ* are elongate, but shorter than the mandibles, and their lobes are not furnished with a dense covering of hair. The *labium* is small and moveable. The *Dytici*, however, have the mandibles short, terminated, as in the omnivorous *Coleoptera*, by two strong teeth, but they have no molar surface. The *labium* is large, and not very moveable; the *maxillæ* resemble those of the *Carabi*. L. This is nearly the form of the mouth in those *Coleoptera* which live on *decaying* flesh; perhaps the *Dytici* feed not on living prey, but on dead animals.^c

Those which feed on *dry* animal matter, have the mandibles and *maxillæ* scarcely projecting beyond the *labrum*; the former are broad, strong, terminated by a short, but very sharp point, behind which is a single small incisive tooth: their inner surface is furnished with an elongate brush of hair, but has no molar surface.

The *maxillæ*, which terminate in a sharp incurved point, have also a considerable tuft of hair, and the *galea* is broad, short, and hairy. Those *Coleoptera* which feed on the pollen of flowers have the mandibles very short, hid by the *clypeus*, furnished with a large molar surface, but their extremity is but little developed. The *maxillæ* are very large, furnished with long tufts of hair. Where they feed on plants, we find the mandibles of *Coleoptera* hid by the *clypeus* and *labrum*, the terminal point blunt, or wanting; the inner edge incisive, and either entire, or divided into several teeth meeting one another; they have a large molar surface. The *maxillæ* are short, but present no other general character.

Such are the principal relations we find in *Coleoptera* between the food and the form of the mouth. The study of the habits of insects has been so much neglected that we know but little of their food, and our notions on this subject are the more indistinct, because we often trust to imperfect observations, or have happened only to observe the exceptions

^c Though I believe M. Straus to be wrong in supposing the *Dytici* not to prey on living animals, yet I have had clear proof of their feeding upon dead animals; having taken *D. marginalis* devouring a large frog, which evidently had been killed, not by the *Dyticus*, but by other means. See also *Erichson*, p. 12.—E. D.

to the general rule. *Clerus apicarius* is generally met with in flowers, hence we might conclude that it fed on honey or pollen; it however is only hunting there for small insects.

In the *Orthoptera* it is difficult to determine the food of any species from the form of the *trophæ*; the herbivorous and carnivorous ones are alike furnished with a molar surface, and the *maxillæ* and *labium* afford no distinguishing character between these. This also applies to the *Neuroptera*. In the *Hymenoptera* the structure of the mouth has undergone much change, but its variations, caused by the nature of the food, are much the same as those of the mouth of *Coleoptera*. In the *Hemiptera* the mouth is still more changed, so that the whole of the species are suctorious. Those which feed on the fluids of animals, differ only in the *general* structure of the mouth from plant-sucking tribes, in having its parts more firm. The mouth of *Diptera* resembles in some respects that of *Hymenoptera*, the parts having undergone less degradation in structure than in the *Hemiptera*. It offers no general character which distinguishes the blood-sucking species from the other. The genus *Pulex*, forming a separate order placed near the *Diptera*, to which it approaches by the form of its *rostrulum*, as well as by its complete *metamorphosis*, seems to place itself at their head immediately after the *Hymenoptera*, its *labium* being furnished with *palpi* and covered by the *maxillæ*.

The food of the *Lepidoptera* being invariable, there can be no change of form in the parts of the mouth arising from this cause.

The intestinal canal has always its two orifices distinct one from the other;^d the mouth in the *Annelida*, *Arachnida*, and in Insects, is always placed at the anterior extremity of the head; in the *Crustacea* it is mostly situated in the under surface of the trunk; the *anus*, however, is constantly placed at the posterior extremity.

The intestinal canal varies much, as well as to its disposition as in its form and length; its variations are not rigorously in relation with those of the parts upon which we rest our classifications, hence we can only lay down very general

^d Many *Zoophytes* have but one orifice to the intestinal canal; the excrements pass through the mouth. In insects the *anus* is sometimes wanting, and some perfect insects have no mouth.

laws of relation, and even these are subject to considerable exceptions.

The food which reaches the intestinal canal retains only its chemical properties, the influence of these is sometimes very sensible; but two kinds of food which influence much the oral organs, may be reduced to very nearly the same state when they reach the stomach.

We may consider the *Annulosa* and *Annelida* as being divided into two divisions according to the form of the alimentary canal: the first division contains those which have all the segments nearly alike in form; the second, those where the segments are dissimilar. In the former, the intestinal canal makes very slight, if any folds, and mostly stretches in a nearly straight line from the mouth to the *anus*; whilst, on the contrary, in the others it makes a number of convolutions, which are more or less considerable according to the nature of the food; that is to say, they are numerous in the herbivorous, and few in the carnivorous. This rule has, however, some remarkable exceptions, the shortness of the canal being sometimes compensated by an increase in breadth. In both divisions it presents more or less distinct dilatations which mark out a distinction of parts, to which we may give the names of *œsophagus*, *ingluvies*, (*jabot*), *ventriculus*, (*jabot succenturié*), *ventriculus bulbosus* (*gésier*), and the Intestine, divided into *duodenum*, *colon*, *cæcum*, and *rectum*, but some of these are often wanting, or have their functions performed by the others.

The relation existing between the alimentary canal and the external form of the body, is a consequence naturally arising from the proportion which must exist between the intestines and the mass of the body. Where the segments are all nearly similar, as in the *Annelida* and *Myriapoda*, the body is generally very elongate, and the alimentary canal has sufficient length when extending from the mouth to the *anus*. Where the segments are dissimilar, the body is mostly short, and inflated in certain parts only, so that the intestine, in order to preserve a length proportioned to the bulk of the body, is of necessity expanded in certain parts, and folded upon itself, that it may be confined in a shorter space. From this it follows that the principal expansions of the alimentary canal are found in the most dilated part of the body. In the *Crustacea* this

is the trunk, and, therefore, it usually contains the gizzard (*ventriculus bulbosus*), the sole expanded part of their alimentary canal; the intestine makes no convolutions in the *abdomen*. In *Arachnida* and Insects the *abdomen*, on the contrary, is the most voluminous part, and this contains the principal expanded portions of the canal, though in *Aranea* the *ingluvies*, or crop, is contained in the trunk. The intestinal canal of carnivorous species, whether they feed on living prey, on blood, or on decaying flesh, is uniformly shorter than that of the herbivorous species, but these last are influenced by the quality of their food, as leaves, fruit, honey, &c., which is not the case with the former.

The gizzard (*ventriculus bulbosus*) is the expansion most constantly present, and where the crop is wanting is very large. It mostly contains certain more or less complicated masticatory organs, which appear to be analogous to the jaws of *Annelida*; they vary much in different genera.

In the *Staphylini*, they consist of from five to ten, or even more longitudinal ridges, placed in the circumference of the gizzard, extending from the *cardia* to the *pylorus*. In *Grylotalpa*, &c., they are replaced by chains of small differently formed pieces. These, as the longitudinal ridges, are sometimes all similar, but more often alternately so. In many species (*Lepisma saccharina*, &c.), these ridges are each replaced by a very hard angular piece. When the *cardia* and *pylorus* are not diametrically opposed, these organs are found on one side of its inner surface alone, as in *Squilla mantis*, or around the *cardia* and *pylorus*, as in *Cancer* and *Astacus*. Sometimes they are altogether wanting.

The name *œsophagus* is commonly given to that part of the alimentary canal which extends from the *pharynx* to the gizzard or stomach. In Man and *Mammalia*, a single name suffices for this part; but in *Annulosa* and *Annelida* it is distinguished into two or more parts, to which separate names must be given, as has been done in Birds. Sometimes we find a crop (*ingluvies*), as in Birds, opening laterally into the *œsophagus*; below this, a part of the *œsophagus* sometimes performs the functions of the crop: this is the *ventriculus*, which, in the herbivorous species, often occupies two-thirds of the length of the alimentary canal. The name of *œsophagus* should be confined to that part which conducts the food to the

crop, or ventricule; and where these do not exist, to the gizzard.

The part which follows the gizzard constitutes the intestine, and is divided into three parts, the *duodenum*, *colon*, and *rectum*. The two latter often differ only in size; sometimes, however, the *rectum* is dilated so as to form a *cæcum*, as in *Aranea*, *Nepa*, *Dyticus*, &c. But in the *Myriapoda* and *Crustacea* we find no difference in these two parts. The *duodenum* is not always distinct, though its limits are mostly marked by the insertion of the biliary vessels.

Intimate Structure of the Alimentary Canal.

The alimentary canal consists of three tunics, or coats; the most internal is a *mucous membrane*, analogous to the villous coat of *Vertebrata*; it is merely a prolongation of the integuments; is very distinct in the *œsophagus*, *ventriculus bulbosus*, and *rectum*; less so in the *ventriculus*; and is very distinct in those species where the integuments are solid. The second tunic (*membrane propre*) is every where easily distinguishable: generally it is white, and very thin; sometimes, however, it is thick, and of a spongy texture. It presents excessively small granulations, which have been considered as the mouths of the absorbents; but it is more probable that they are gastric glands. The third is the muscular coat, which only clothes certain parts, as the intestines and gizzard, sometimes the *œsophagus*, and yet more rarely the *ingluvies* and *ventriculus*.

We find in the articulated animals no true *peritoneum*; but the *viscera* of the *Arachnida* are retained in place by transverse fibrous septa, of a loose texture, which pass perpendicularly from the intervals of the segments, being, as it were, so many diaphragms. The *viscera* of *Crustacea* are connected by a loose cellular tissue; those of Insects and *Myriapoda* are retained in place by the *tracheæ*.

Secretory Glands dependent upon the Alimentary Canal.

The difference of form and structure which we find in the glands of different species, is due principally to the difference in the mode of circulation of the blood in different classes.

In the *Annelida* and *Crustacea*, where the blood circulates in vessels, we find more or less voluminous conglomerate glands, the largest of which, in the *Crustacea*, has been considered as the analogue of the liver of *Vertebrata*; the second in size, that of the *pancreas*, or of the kidneys, according as the point of their insertion is near to the gizzard or *anus*. Those canals whose excretory ducts open into the mouth, or *pharynx*, may be called salivary glands.

In Insects, *Myriapoda*, and the Trachean *Arachnida*, from the difference of the circulatory system, the blood would not, in such glands, be renewed with sufficient quickness; the glands, therefore, in these, take the form of long thread-like vessels, which, from their floating in the blood, are easily penetrated by it. This form is not incompatible with a complete circulation, for we meet with it in *Limulus*, and the Pulmonary *Arachnida*.

There are from one to five kinds of these, but they are never all present in one species, or at least they are never all apparent.

The salivary glands are two or four vessels, of varying length, simple or ramose, sometimes having their extremities expanded.

The glands, to which term biliary vessels is commonly given, are two, four, or six slender, and very long vessels, inserted in different genera, into various parts of the intestinal canal, sometimes above, sometimes below the gizzard. These two extremities sometimes both open into the canal at the same point, sometimes at very distant points. Sometimes their number is very considerable; they are then either placed in a whorl round a certain part of the canal, or united upon two or more tubercles, placed around one point of the intestine; sometimes, before their insertion, they all unite into one common duct.

A third sort of glands, secreting a digestive fluid, may be called *gastric* glands: these have been mentioned above. When present, they always cover that part of the intestinal canal above the biliary vessels. In the *Silphæ*, the posterior part of the intestines is likewise covered with granulations; these may be called the *intestinal glands*.

In many insects, particularly the carnivorous, there exists a fifth kind of gland, the products of which are poured into the

intestinal canal near the *anus*. These are the urinary vessels, and they have sometimes, near their insertion, a reservoir, which performs the functions of a bladder. In all insects we find at least *one kind* of these glands, inserted sometimes above, sometimes below the gizzard. From the experiments of M. Rengger, it appears that these organs are urinary organs. The analysis of their contents confirms this, they being composed of ammonia, potass, and uric acid, existing probably in the form of a suburate of potass and ammonia.

PART IV.—GENERATION.

In the *Myriapoda*, *Arachnida*, and in Insects, the sexes are invariably separate; and it appears doubtful whether any of the *Crustacea* are really hermaphrodites, though as yet no individuals of some genera, as *Cypris* and *Apus*, have been found unfurnished with eggs. In the *Annelida*, most of the genera are imperfectly hermaphrodite. In *Crustacea* and Insects we find some species which, though not hermaphrodites, are capable of producing young without fecundation for several generations. Jurine observed that the Crustaceous genus, *Daphnia*, possessed this faculty to the sixth generation. The first genus of Insects in which this power was observed, is *Aphis*, and here it is very striking. Mr. Coulter, an Irish naturalist, relates, that *Smerinthus Populi* can produce several generations without fecundation.^e

All the *Annulosa*, and most of the *Annelida*, are exclusively oviparous, or ovo-viviparous; but some of the latter, as *Nais*, &c., besides being oviparous, multiply almost after the manner of the *Zoophytes*, the posterior part separating, and becoming a perfect individual.

Here we may notice the power possessed by some animals, of renewing parts of their bodies which may have been broken off. In Insects and the *Scolopendræ* this never takes place; and, moreover, a simple wound never heals, it only dries over. In *Crustacea* and *Arachnida*, the feet are capable of being reproduced exactly in their original form. But does this faculty

^e Who is Mr. Coulter? and will he favour the world with some further particulars with regard to this extraordinary fact, which M. Straus relates on the authority of a statement made by Mr. C. to him?

continue during the whole of the animal's life, or does it cease as soon as it becomes adult? Perhaps the latter is the correct opinion; for the Rev. Lansdown Guilding has observed, that the *larva* of *Phasma cornutum* can reproduce the feet it may have lost, though the *imago* cannot.

In *Nais*, and some other *Annelida*, the body, if divided, becomes two perfect individuals.

Most of the *Crustacea* carry their eggs attached to the body, not to assist in hatching them, but to protect them. Some, however, abandon them as soon as they are laid.

The *Araneidæ* in general envelop their eggs in a silken cocoon, where they remain until the young appear. The *Epeiræ* merely attach them to some solid body, and then leave them; others, *Theridion*, *Pholcus*, &c. (*araignées filandières*), watch over the cocoon in some sheltered place, where they have fixed it, to aid the escape of their young; others, the *Lycosæ*, carry the cocoon with them, to give to their offspring the same maternal care.

Insects, with the exception of the genus *Termes*, and most of the *Hymenoptera*, simply deposit their eggs, and leave them, without giving themselves any further trouble; but the care bestowed by the Insects forming the exceptions to this rule is very remarkable.

The eggs of some *Orthoptera*, as *Mantis* and *Blatta*, are excluded, enveloped in a case, where each has its separate compartment.

The most singular fact in the generation of Insects is, that no species, when hatched, has exactly the same form as the parent, and only acquires it by two transformations, called its *metamorphoses*.

Among the *Myriapoda*, the *Juli* alone undergo *metamorphosis*.

The *Scolopendræ*, the *Thysanoura*, the Pulmonary *Arachnida* and *Phalangium*, appear not to undergo any change; but the *Acari* and some of the *Crustacea* do.

PART V.—RESPIRATORY SYSTEM.

No where do we find the respiratory system carried to so high a degree of development as in Insects; yet its functions

are far less energetic than in the warm-blooded *Vertebrata*, for they can endure long a highly rarefied atmosphere, or even irrespirable gases, without perishing.

In Insects, the circulation having reached such a degree of simplicity and imperfection, that the blood cannot be brought to one special respiratory organ, this inconvenience has to be remedied by replacing the circulation of blood by that of air. In *Vertebrata* it is the blood which goes to meet the air; in Insects the air seeks the blood.

This circulation of air takes place by means of vessels called *tracheæ*, which are distributed throughout the body, after the manner of the arteries of the higher animals. These *tracheæ* communicate with the external air by means of certain openings called *stigmata*, which never exceed eighteen in number, placed one on each side of the *prothorax*, the *mesothorax*, and the seven anterior segments of the *abdomen*. Each of these *stigmata* communicates with one large, and mostly very short, *trachea*, commonly called the primary *trachea* (*trachée d'origine*), from which numerous branches spread throughout the body. In some species there arise, from each primary *trachea* from one to five branches, the longitudinal *tracheæ* (*trachées de communication longitudinale au trachées longitudinales*), which run to the other *stigmata* of the same side, to establish a communication between them. Other branches arise more or less directly from the primary *tracheæ*, to anastomose with the *tracheæ* on the opposite side; these may be called transverse *tracheæ* (*trachées de communication transversales, ou trachées transversales.*) Besides these, every primary *trachea* sends off innumerable branches, which, with the other branches arising from the larger trunks, penetrate every part of the body. Such is the distribution of the *tracheæ* in the *Coleoptera* and *Scolopendræ*.

In other insects, as *Blatta*, *Locusta*, &c., each primary segment sends off several trunks, some of which follow the sides of the segment to which they belong, directing their course towards its median line, where they open into a longitudinal *trachea*, which is continued throughout the whole length of the body, as well above as below. At each segment these longitudinal trunks send off a branch which anastomoses with the opposite longitudinal *trachea*. From these different trunks the smaller branches are distributed over the body.

Lastly: there exist some families, as Trachean *Arachnida*, and the *Chilognatha*, where the *stigmata* do not communicate, the *tracheæ* ramifying directly from them to be spread over the body.^f

The branches of the *tracheæ* are in general slightly tapering, as the arteries of higher animals; but sometimes, especially in the Lamellicron *Coleoptera*,^g they form, from space to space, vesicles of different sizes, from which small branches are sent off to the neighbouring organs.

It appears that *ammoniacal* gas is that which most quickly destroys insects. In azote they can live several days; and though a *Melolontha vulgaris* was observed to fall motionless when immersed in pure hydrogen for fifteen minutes, yet it returned to life after remaining fifty hours in that gas.

Respiration, it seems, can only be carried on by moistened surfaces; hence the lungs of the higher animals are always moistened by their own transpiration, whilst aquatic animals have often exterior *branchiæ* moistened by the water. Some *Annelida*, as the earth-worm and leech, which breathe by the skin, have this always moist: in the former, from the effect of the damp earth, which they inhabit; in the latter, by a viscous matter, which covers the skin. But in this respect, the *Onisci* offer the last degree of possibility, as they breathe air by means of *branchiæ*; yet, as the respiratory surfaces of their *branchiæ* are not entirely exposed, but covered by *laminæ*, parts of the organs themselves, it is possible that they may never be entirely dry.

In following the scale of gradation of the respiratory system in the articulated animals, we find it almost disappear in the *Annelida abbranchia*, where the respiration is performed by the whole surface of the body. By degrees we see it reappear, either as *branchiæ*, lungs, or lastly, as *tracheæ*; and this difference depends, on the one hand, upon the medium which these animals inhabit, and, on the other, upon the gradation which the respiratory and circulatory systems follow.

In the *Crustacea* these organs are external, at least are

^f This is the case also with some Lepidopterous larvæ, in which I have observed the *tracheæ* to ramify directly from the *stigmata*. This might naturally be expected, when we consider that the progressive development of individuals resembles that which we find as we trace the gradation of organs from one group to another.—E. D.

^g And the *Buprestidæ*, but not the *Elateridæ*.—E. D.

only covered by the *carapace*; they may then be considered as *becoming* internal; but whatever may be their situation, they are constantly in dependence upon the feet.

In the Pulmonary *Arachnida*, the organs of respiration become really internal, forming more or less numerous sacs which do not ramify, placed in corresponding groups in the lower part of the body, communicating with the air by one *stigma* for each group.

In the Trachean *Arachnida*, and the *Chilognatha*, these sacs are prolonged into long branching vessels, disposed in tufts around the *stigmata* without communicating one with another.

In Insects, and the *Chilopoda*, the trachean system has reached its highest development, the *tracheæ* arising from each *stigma* all communicating with one another.

The larvæ of *Ephemera*, which live in water yet breathe only air, have the *stigmata* furnished with long foliaceous appendages, containing air, which absorbs the oxygen from the water, and enables it thus to be conveyed throughout the system.

The *tracheæ* of insects, *Myriapoda* and *Arachnida*, consist of three tunics, of which the external is an extremely thin colourless membrane, not fibrous in its texture. The second is a thread of a stiff corneous texture, wound in a spiral. This thread is commonly round, but sometimes flat; when round, its whorls are in general less regular than when flat, being mostly separated by a void of double the width of the thread. The same thread is continued throughout one branch; and when this sends off a lateral branch, the turns of the spire simply separate to give room for its insertion. When the *tracheæ* bifurcate, the original thread ceases, and each branch has its peculiar one.

The third tunic is a very thin, white, mucous membrane, a mere prolongation of the integuments.

[I shall not enter into any abstract of the Circulatory System; the incorrectness of the view taken of it by M. Straus being fully proved by the observations of Mr. Bowerbank; nevertheless, it is but justice to M. Straus to say, that his remarks on this subject well merit attentive perusal; and had I not felt that I have already occupied too much space with a subject that is not perhaps likely to be of general interest, I should have given an abstract of this part as well as of the others.]

PART VII. — NERVOUS SYSTEM.

Of all the invertebrated animals, the *Articulata* are those which present the most developed nervous system. In them, as in the *Mollusca*, this system of organs differs chiefly from that of *Vertebrata*, in being placed, with the exception of the first pair of *ganglia*, below the alimentary canal; whilst in the *Vertebrata* it is always above: and although some of the lowest *Vertebrata* approach so near to the *Annelida* in other respects, we find no approach in the form of the nervous system.

Some have supposed the nervous system in the *Annulosa* to be the analogue of the only great sympathetic nerves of higher animals; but this can hardly be the case; for these furnish nerves almost solely to the vital organs, whilst the spinal marrow of the *Annulosa* furnishes nerves to nearly the whole of the body.

By comparing the nervous system to the other systems of organs with which it is in relation, we arrive at the conclusion, on which we can establish the following laws:—

FIRST LAW.—When the body is composed of similar segments, the spinal marrow has as many *ganglia* as there are *sterna* (*sterna* with the muscles which are repeated with them), varying in size according to the mass of organs of animal life which each segment contains, and the greater or less degree of activity of these organs.

The *ganglia* are commonly placed in the middle of the sternal pieces, at the intersection of the axes of the *coxæ*.

The length of the chords of the spinal marrow, being determined by the distances of the *ganglia*, is here equal in all the segments.

The terminal part of the chords placed beyond the last *ganglia* are distributed, after the manner of the principal nerves, to the posterior part of the body. When the body is composed, commonly of two, or, rarely of three parts, besides the head, distinguished by the form of the segments of which they are composed, one of these parts, which may be called the trunk, and which is always the anterior, retains the principal organs of animal life, as the feet; whilst in the posterior, those organs subject to the will are more or less reduced,

owing principally to the absence of the feet. The nervous system is variously influenced by this change in the segments; and we may distinguish two forms of animals in this condition: first, those where the mass of the *viscera* is contained in the trunk; secondly, those where it is contained in the *abdomen*. In the former, the nervous system obeys the following laws.

SECOND LAW.—Where the trunk is composed of segments, either moveable, immoveable, or anchylosed, but distinct in the sternal region, whilst the *abdomen* is formed of perfectly moveable segments; the pairs of *ganglia* are repeated in each segment of each part, their size being proportioned to that of the organs of animal life contained in each segment; and the length of the chords of the spinal marrow is subject to the same conditions as in the preceding law.

THIRD LAW.—When the trunk is composed of segments, either moveable, immoveable, or anchylosed, but distinct in the sternal part, whilst the segments of the *abdomen* are immoveable, and, whether anchylosed or not inferiorly, without muscles to move them; the *ganglia* are repeated, only in the segments of the trunk, in the manner of the former case; but the *abdomen* contains none, and receives its nerves from the last pair of *ganglia* of the trunk, which is then larger than the others. The terminal part of the chords of the spinal marrow is prolonged nearly to the extremity of the *abdomen*, where they distribute themselves.

FOURTH LAW.—Where the trunk is composed of several segments entirely united into one, or anchylosed so completely that we cannot perceive any traces of the sutures of the different sternal pieces (the feet then radiating round a common *sternum*), and the *abdomen* also is formed of segments entirely anchylosed, be they otherwise distinct or not; we find only one pair of *ganglia* furnishing all the nerves of this part of the body. This pair of *ganglia* is placed at the centre from which the feet radiate, (it is formed by the union of all the *ganglia* of the segments which compose the trunk). In the *abdomen* there is no *ganglion*, (this part containing only vital organs,) and the nerves arise either from the *ganglion* of the trunk, or from the chords of the spinal marrow, which are prolonged to the extremity of the *abdomen*; but when this part contains mixed muscles, (serving for respiration,) the chords present a few extremely small *ganglia*.

Where the mass of the *viscera* is contained in the *abdomen*, the nervous system follows the subsequent laws.

FIFTH LAW.—When the trunk is composed of segments, either moveable, immoveable, or anchylosed, but distinct in the sternal region, whilst those which form the *abdomen* are perfectly moveable; the *ganglia* are repeated in each part, but with this difference, that those of the trunk are always very large, and each segment has its own peculiar pair, whilst in the *abdomen* they are much smaller, often less numerous than the segments, and their situation is not always constant.

SIXTH LAW.—If the trunk is composed of distinct segments, whether these be moveable or anchylosed, and the segments of the *abdomen* are very little moveable, or anchylosed, even if this is the case only in their inferior arches, the *ganglia* are repeated in the trunk, as in the preceding case, but not in the *abdomen*; and the segments of this latter receive their nerves from a large pair of *ganglia* placed in the anterior part of the visceral cavity, or in the trunk itself. The chords of the spinal marrow are prolonged nearly to the extremity of the *abdomen*.

SEVENTH LAW.—When, on the one hand, the segments of the trunk are entirely confounded, so as to leave no trace of suture, especially on their lower part, (the feet then radiating round a common *sternum*,) and, on the other hand, the segments of the *abdomen* are immoveable, whether confounded in one or not, there exists in the trunk only one pair of *ganglia*, as in the species which come under the fourth law; and in the *abdomen* there is but one single pair of *ganglia*, as in the species which come under the sixth law.

EIGHTH LAW.—The brain, which exists in all the articulated animals, is always placed above the alimentary canal, and its size varies according to the number and nature of the organs to which it furnishes nerves.

The *Encephalon* being found where the head has entirely disappeared, seems to indicate that it is not subject to the same changes as the latter.

As it may happen, that in two neighbouring genera the segments of the *abdomen* are moveable in the one, and fixed in the other; according to the second, third, fifth, and sixth laws, the nervous system of these two genera ought to differ

strikingly, and observation confirms this. In *Lucanus* the abdominal *ganglia* exist, but not in *Melolontha*.

These laws, which we have pointed out as governing the nervous system, are but the consequence of others more general. These general laws shew us that the number and size of the different nervous trunks depend always on the functions of the organs to which they are distributed; that is to say, the largest are destined to the organs of the senses: the next in size to the muscles, and the smallest to the vital organs; but the size of the nerves seems also to depend on other causes, so that the first general rule we have pointed out offers several exceptions.

In the organs of the senses the size of the nerves appears to be in an inverse ratio to the density of the agent to be perceived: and as light is the most subtle of these, the eyes are, *cæteris paribus*, the organs which receive the largest nerves. Next in size are the antennal nerves, which may possess the power of hearing; then the nerves of the *palpi*. The mandibulary nerves, which, perhaps, enjoy the perception of taste, are still smaller. The feet, as the organs of feeling, properly so called, possess pretty considerable nerves; lastly, the skin, as the organ of the general sense of feeling, receives only very small branches.

In the second place, the size of the nerves is always in proportion to the bulk of the organ to which they are directed, and their thickness is also proportionate to the greater or less complication of the organ, compared to its analogues in other species. Lastly, the size of the nerve is always in relation to the degree of sensibility of the organ in one species, as compared with another.

In the muscles, the nerves are, on one hand, proportioned to their size, on the other to their activity. The vital organs, which are not subject to the will, receive very small nerves in proportion to their bulk.

The *tracheæ* receive no nerves, but the respiratory muscles, which are in part subject to the will, receive nerves less strong than those of the organs of animal life, but more so than those of vegetable life.

The nervous trunks of the second size are distributed to the vital organs; those of the third size, to the secretory organs.

Amongst a great number of observations made upon the nervous system of the articulated animals, which have led to the discovery and verification of the laws of relation given above, the genus *Blaps* is the only one that has formed an exception. The segments of the *abdomen* are here anchylosed inferiorly, and above are so encased by the *elytra*, which are connate, as to be incapable of motion; yet we find the *ganglia* repeated in the *abdomen*, as they would be did it enjoy the power of motion. Probably this is owing to some secondary cause, which modifies the result of the primary causes.

The nerves are covered, as in *Vertebrata*, with a *neurilema* which can easily be separated. This coat is thick upon the *ganglia* and spinal chords, much thinner on the nerves. The nervous substance appears scarcely to differ from that of *Vertebrata*, being formed of two parts, the one, the cortical, is brown, the other, the medullary substance, white.

In concluding this article, I cannot but express the regret I feel at my utter inability to do justice to M. Straus; first, from not possessing a sufficient degree of knowledge of anatomy in general, and secondly, from a want of sufficient leisure to give to this paper that care which it required. This last must also be my excuse for omitting much interesting matter, especially that which relates to the senses and instinct of these animals. I may here make one remark on the subject of the antennæ. M. Straus regards these as the organs of hearing; and this conjecture certainly receives some support from the fact, that the nerve, supposed to be the auditory nerve of *Crustacea*, is a branch of the antennal. But surely this is but a slight foundation to build upon; with equal reason might we assert that the antennal nerve cannot be the auditory nerve, because in the higher animals it always arises from the posterior part of the brain. One thing, however, may be said on this subject. It has been clearly proved that the sense of hearing does not solely depend on the ear, or at least the *brain* itself is capable of hearing sounds. When the ears were hermetically closed, a patient upon whom the operation of trepanning had been performed, could distinctly hear the ticking of a watch, and even understand conversation at some distance; but on the aperture of the skull being closed, by placing the hand over it, no sounds could be heard. I will

now bid your readers good bye, perhaps for a long time, assuring them that if they have found aught in this paper pleasing to them, they must give all the credit thereof to our author, not to me.

Yours,

E. DOUBLEDAY.

ART. XI.—*The other End of a Trip to the Isle of Wight.*
By RUSTICUS, of Godalming.

[The first portion of this narrative was published in Mr. Loudon's Magazine of Natural History, Vol. VI. p. 25 ; to which we beg to refer our readers.—ED.]

SIR,—The following day was spent in a repetition of the cruise under the cliff, with pretty much the same success ; and the next morning we started on foot for the southerly point of the island. The wind had been sinking during the whole of the previous day and night, and what air remained blew light as zephyr off shore. The sea was without a ripple ; and the chalk cliffs, the two rocks in the bay, and the distant St. Catherine's, were mirrored on the bosom of the ocean so completely, that every straggling sheep, browsing the turf above the cliffs, was as distinctly to be seen in the reflection as the reality. I shall never forget the quiet beauty of the scene :—there was nothing wild or grand in nature ; nothing wonderful in art ; there was neither church, house, tree, nor shrub, nor aught to excite the beholder to exclamation ;—quiet sea—unromantic, unvariegated, perpendicular, white cliff—monotonous downs. Nature seemed to be at rest ; man seemed to be a stranger ; he was no where disturbing her repose ; he had no where distorted her figure ;—the distant tower of St. Catherine's was the only visible proof that he had existed.

The tide being out, we walked below the cliff, and amused ourselves with the vagaries of the little crabs, which, like the generality of mankind, appear to be looking one way while they go another ; the smooth sand was curiously mapped out by the infinity of their tracks. We established a crab-race ; and gallantly did the little urchins perform. A little direction was required now and then to keep them from bolting off the course ; but in the main they behaved very well, and

temperately ; and their sideling gait had the air of circumspection and calculation. You smile, good Sir, at our childishness ;—you are welcome. We laughed outright. Under the sea-wrack were shoals of that little jumping shrimp^a with a large head. which is found on nearly every coast. On lifting up a handful of sea-wrack, they swarmed and leaped about like fleas—some of them being scarcely bigger. These little fellows are the best anatomists in the world : in a single night they will turn a small animal into a more beautifully white, and clean, and perfect skeleton, than can be obtained by any other means. They are of all sizes, from half an inch long to no size at all.

Our double-barrels had been laying idle in the hollow of our arms for some hours, when a flock of ring-dotterels and purres started up before us, and, taking a circuit over the sea, settled again, farther on, at the very edge of the rising tide :—here, they boldly ran into the water for any floating food they might spy, sometimes allowing each little swell to take them almost off their legs. We put them up again and again, and succeeded in bringing down three of them ; but they always fell in the sea, and were lost to us. At last, they altered their minds, and, instead of going our way any farther, took a wider sweep over the sea, and settled behind us. One bird, which it was our particular object to obtain in this journey, we did not even get a glimpse of,—the red-legged crow. We had been told by an Ornithologist of great accuracy, that it breeds in several parts of these cliffs every year ; but of this there seems to be great doubt ;—its chief resort appears to be the Cornish coast.

Near Black-Gang Chine I had the good fortune to meet with an insect I never saw before or since. The soil was a kind of loose sand, with a good many short blades of withered grass sticking up out of it, the runners of which crawled along the top, or just below the top, as the case might be, and now and then shooting down a root to hold fast by ; looking altogether something as though an old tanned fishing-net had been thrown over the soil to keep it from blowing away, and had shot out and taken root at the knots, just for its own amusement, or as a hold, in case the sea-breezes should be too much for it. In this place, stopping to pick up a feather, I saw something move in the sand, but as soon as I could fix my eye on it, all was still, and I could

^a *Talitrus Locusta*. ED.

only find a little hole, as round as though some one had stuck a common lead pencil into the sand and taken it out again. There was a neat and perfect roundness in the hole, which told me at once it was a tenement of some kind; and sundry cases of beetles, legs of gnats, and dried dew-moths, scattered round it, signified, moreover, that it was inhabited by some inhuman Polyphemus. I was soon down on my knees, and had my knife out ready for digging, when, within a foot of the first, I saw another stir—and another round hole instantly appeared. It now occurred to me that I might, with quietness and patience, get a sight of one of these hermits while he was sunning himself; I therefore lay as still as a cat watching at a mouse-hole, and was soon rewarded by seeing the gentleman make his appearance almost close under my nose. Unluckily, like Alexander, I had placed myself between the sun and my Diogenes, and this seemed to make him very fidgetty and uneasy, so I obliged him by moving quietly out of the way, and letting the sun shine on him, by the same movement bringing my eye within about fifteen inches of him. Nothing appeared but a broad flat head, which fitted very accurately the mouth of the hole, and which was furnished with bright shining eyes, and a pair of horrible jaws, held wide apart: these shears had doubtless cut the thread of existence for many a poor wanderer, whose luckless star had led him to the abode of this child of Erebus.

I cut off the gentleman's retreat by passing a stick into the sand, sideways, so as to cross his burrow, and then with a bit of a jerk unearthed him and laid him sprawling. O, such a beauty! the *Parcæ*, sweet creatures, the *Eumenides*, gentle turtle-doves, were lovely in comparison: I'll describe the animal with an eye to science.—Aspect, vicious; temper, ferocious; eyes, infernal; jaws, diabolical, stuck on the wrong way, like a figure-head shipped looking aft; head, big; back, humped, the hump adorned with two hooks;—there, Mr. Editor, there's a description! it only wants putting into cat-Latin to be perfect! When first unearthed, he was monstrous sulky, and lay twisted in a kind of half-kink, for all the world like a pot-hook: but he soon found the inconvenience of this, and set to work to make another hole, for which he used his feet and jaws, loosening the sand with his feet, and fetching it out with his jaws; in this way he got down about half an inch,

and then adroitly hanging himself to the edge of the hole by the hook in his back, he continued his labours in this droll position : at last he got quite out of sight, and as he did not come up again, I concluded he was taking a nap after his labour, and so I would not again disturb him.

This ugly grub, as my friend ——— tells me, is the larva of *Cicindela campestris*,—a beautiful green beetle, which is common in all sandy places in the summer, and pursues the whole insect race with unceasing ferocity. The gentleman runs and flies so fast as to puzzle the hunter, and, most commonly, to get away from him ; and when you do get hold of him, he fights, and bites, and struggles, to the last. ——— told me of another larva, which he said he had himself met with near Marseilles, called the *Fourmilion*, or Ant-lion ; whose operations, if you will have them as an episode, are on this wise :—

A loose light sand is the favourite soil of the Ant-lion. In this he makes his snare, and passes the first part of his life. His snare is a round hole, about two inches wide at top, and with sloping sides, gradually lessening to a point at the bottom, where the tenant lays in wait, his jaws only being visible, and the rest of his body hidden beneath the sand. The sides of this trap are made of the finest and driest sand, which, when an insect of any kind gets into it, gives way beneath its feet, and so conducts it, in the most amiable and natural manner, into the very jaws of its devourer. It sometimes happens, that a shower has made the sand more solid, and better footing, than when quite loose ; and then the luckless mortal, who has inadvertently dropped or flown into it, begins to remount the side with ease and fancied safety ; but, alas, the safety is only fancied ! Mark the deepness of the rogue, in hiding : he dips his jaws into the sand, and, being a capital marksman, jerks it, with certain aim, on the back of the intruder, not once only, but again, and again, and again ; and thus keeps up such a constant and well-directed fire, that the poor creature is at last tired out, and slides into the power of its enemy. The ant-lion is about the size of a large garden-spider, and something like it in shape ; after it has fed for five weeks on all the stragglers that were unfortunate enough to get in its way, it spins itself a white silky covering, and changes to a chrysalis, and afterwards

to a beautiful lace-winged fly, which emerges from the sand like a spirit escaping from a tomb.

It was night before the three weary travellers reached Sand-Rock Hotel. Beauteous spot!—Undercliff, never to be forgotten;—when first I saw thy bewitching face, the full-moon was riding triumphantly over the ocean, silvering the multitudinous ripples with her reflected image, and making a broad and glorious track of ever-varying light—and thou wast bathed in more than ordinary splendour by the brightness of her beams! After roughing it on the ocean, and among the cliffs of Fresh-water and the Needles, the quietude and luxury of this spot seemed to invite repose; we tarried there many days; and then, walking through Appeldurcombe and Newport, arrived at Cowes;—and there, taking ship, sailed to Portsmouth, and so returned.

I am, Sir, Your's, &c.

RUSTICUS.

ART. XII. — *Monographia Chalciditum*. By FRANCIS WALKER, Esq. F.L.S.

(Continued from p. 39.)

“ ——— the green myriads in the peopled grass.”

GENUS CEROCEPHALA, *Westwood*.

Theocolax . . *Westwood*.

Læsthia . . *Haliday*.

Epimacrus . . *Walker*.

Caput anticè tridentatum: *maris* antennæ 10-articulatæ, moniliformes; *fem.* 9-articulatæ, breviores, tenuiores, subclavatæ: thoracis segmenta alifera in apteris minima, in alatis majora: petiolus brevis aut elongatus: alæ nunc minimæ, nunc amplæ: nervi soliti pars humeralis^a brevis; pars ulnaris longior, basi spinam erectam brevem latam gerens; a *Spalangia* quoque radio brevior et cubito longiore differt: metalæ nervo simplici ultra costæ medium producto.

^a See Ent. Mag. Vol. I. p. 334. Note.

The other characters of this genus are noticed in Mr. Haliday's description of *Læsthia*, Vol. I. pp. 335 & 336 of this Magazine.

Sp. 1. Cero. cornigera. Mas. et fem. *Rufa aut ferruginea, nigro plus minusve variegata, alis albis fuscofasciatis.*

Cerophala cornigera. *Westwood. Guerin. Magasin de Zoologie. 1^{ère}. Livraison, Pl. 4.*

Epimacrus rufus . *Walker, Ent. Magazine, Vol. I. p. 369.*

Mas.—Nigro-fuscus, nitens, ferè glaber, pubescens: caput magnum, thorace latius, ferrugineum: oculi ocellique fusci: antennæ nigro-fuscae, pubescentes, corporis dimidio longiores, basi obscure ferrugineæ: prothorax anticè, utrinque et subtus ferrugineus; squamulæ concolores: metathorax scaber, obscurus, apice ferrugineus: petiolus abdominis dimidio vix brevior, linearis, ferrugineus, obscurus: abdomen nigrum, thorace latius, brevi-ovatum, convexum, glabrum; segmentum 1^{um}. fusco ferrugineum, maximum; sequentia parva: pedes fusci, subtus et tarsi omninò fulvi: alæ albæ, ciliatæ; proalæ sub ulnæ basi fusco-maculatæ, sub cubito fusco-fasciatæ: nervus solitus fuscus; ulna basi et cubitus nigra, crassa. (Corp. long. 1—1 $\frac{1}{4}$ lin.; alar. 1 $\frac{1}{4}$ —1 $\frac{1}{2}$ lin.)

Var. β.—*Fem.* ferrugineo-ænea: caput ferrugineum; vertex ferrugineo-æneus: antennæ ferrugineæ, apice fuscae: thoracis latera et pectus abdominisque basis subtus ferruginea; pedes concolores, subtus et tarsi omninò fulvi.

Taken by Mr. Stephens, near Ripley, in Surrey; by Mr. E. Doubleday, near Epping, and by Mr. Lewis, near London.

Sp. 2. Cero. formiciformis. Mas. et fem. *Ferruginea, alis vix ullis.*

Theocolax formiciformis. *Westwood, Lond. and Edin. Phil. Mag. Third Series. Vol. I. No. II. p. 127.*

Læsthia vespertina . . *Haliday, Ent. Mag. Vol. I. pp. 335, 336.*

Taken near Paris, by M. F. de Laporte. I have found it crawling on paper, once near London; and once, in September, near Linton, North Devon.

GENUS MACROGLENES, *Westwood*.

Caput transversum, anticè depressum et subproductum, *maris* magnum thorace latius, *fem.* mediocre thorace vix latius : *maris* oculi maximi, posticè ferè conjuncti, capitis partem majorem occupantes : *fem.* oculi mediocres, laterales : ocelli 3 supra verticem trigonè dispositi, *maris* postici vix conspicui : mandibulæ paullò arcuatæ, apice dentibus 4 acutis armatæ : maxillæ elongatæ : palpi maxillares triarticulati, mediocres, filiformes ; articulus 3^{us}. longus : mentum ovatum : labium parvum, anticè ciliatum : palpi labiales minimi, biarticulati : *maris* antennæ 10-articulatæ, clavatæ, breves, capite paullò longiores ; articulus 1^{us}. gracilis ; 2^{us}. mediocris, ovatus ; 3^{us}., 4^{us}., et 5^{us}., minimi ; 6^{us}. et 7^{us}. magni, lati ; clava ovata, apice acuminata, articulis 2 præcedentibus longior et latior : *fem.* antennæ 9-articulatæ ; articuli 3^{us}. et 4^{us}., minimi ; 5^{us}. et 6^{us}. magni, lati : thorax ovatus : prothorax minimus, supra vix conspicuus : mesothoracis scutum magnum ; parapsides optimè determinatæ, convexæ ; paraptera et scutellum magna, hoc angustum : metathorax sat magnus : *maris* abdomen sessile, valdè compressum, laminæ similis, thorace vix brevius ; segmentum 1^{um}. longum, sequentia breviora : *fem.* abdomen compressum, thorace paullò longius : oviductus subexertus : pedes simplices, breves ; coxæ parvæ ; tibix rectæ, apice spinis armatæ ; tarsi graciles, articuli 1^o. ad 4^{um}. longitudine decrescentes, 5^{us}. 4^o. longior ; ungues et pulvilli parvi : alæ breves ; nervus solitus ubi costam attingit quasi discriptus, ultra costæ medium ramulum brevem emittens stigmate rotundo terminatum ; et mox abruptus ; metalæ nervo unico simplici costæ medium non attingente, stigmate punctiformi terminato.

Sp. 1. *Macr. oculatus*. Mas. et fem. *Viridis aut cyaneus, plus minusve æneo variegatus, antennis pedibusque nigris, alis hyalinis.*

Macroglenes oculatus. *Westwood, Lond. and Edinb. Phil. Mag. Third Series. Vol. I. No. II. p. 127.*

Mas.—Caput nigrum, obscurum : oculi ocellique rufi : antennæ nigrae, pubescentes ; articulus 1^{us}. nigro-viridis, glaber : thorax æneo-viridis, nitens, ferè glaber, vix pubescens : abdomen viride, nitens, glabrum, supra æneum, apice pubescens : pedes nigri, non pubescentes ; trochanteres fusi ; tarsi rufi, apice nigro-fusci :

alæ albo-hyalinæ, iridescentes, ciliatæ ; nervi fusci ; stigma obscurius, parvum.

Fem.—Nigro-viridis : abdomen cyaneo-viride. (Corp. long. $\frac{2}{3}$ — $\frac{3}{4}$ lin. ; alar. $1\frac{1}{2}$ lin.)

Var. β.—*Mas*, thorax viridis : mesothoracis scutellum, metathorax et abdomen cyanea.

June and August ; on grass in fields ; near London. June ; Windsor Forest.

Note.—This genus is allied to *Pirene*, and probably connects the *Spalangiidæ* and the *Ormoceridæ*.

GENUS ASAPHES.^b Walker.

Caput mediocre, thorace vix latius, transversum, non anticè productum, inter oculos subimpressum : oculi mediocres, laterales : ocelli supra verticem trigonè dispositi : mandibulæ arcuatæ, bidentatæ ; dentes longi, acuminati : maxillæ elongatæ, internè apicem versus in lobum productæ : palpi maxillares biarticulati, mediocres : mentum ovatum : labium sat longum, anticè impressum : palpi labiales breves, crassi, biarticulati ; *maris* antennæ 12-articulatæ, clavatæ, thorace breviores ; articulus 1^{us}. gracilis, flagelli dimidio longior ; 2^{us}. mediocris, elongato-cyathiformis ; 3^{us}. minimus ; 4^{us}. et 5 sequentes breves, cyathiformes ; clava ovata, acuminata, articulos 2 præcedentes longitudine adequans : *fem.* antennæ paullò breviores ; clava paullò brevior et obtusior : thorax ovatus, convexus : prothoracis scutellum magnum, subquadratum : mesothoracis scutum maximum ; parapsides benè determinatæ ; paraptera et scutum magna, hoc conicum : metathorax mediocris : *maris* abdomen ovatum, convexum ; segmenta 1^{um}. et 2^{um}. maxima, 4 sequentia minima ; segmenta 5 ventralia subtus conspicua : *fem.* abdomen paullò longius, subtus carinatum, apice elevatum ; segmenta 5 dorsalia subtus basin versus retracta, et ventralia nisi ad basin tegentia : oviductus subexertus : pedes simplices ; coxæ parvæ ; tibiæ rectæ, apice spinis armatæ ; tarsi graciles ; articuli 1^{mo}. ad 4^{um}. longitudine decrescentes, 5^{us}. 4^o. longior : ungues et pulvilli parvi : alæ angustæ ; nervus solitus ramulum sat longum emittens ; stigma ramulum emittens brevissimum.

^b ἀσαφής, obscurus.

Sp. 1. Asa. vulgaris. Mas et Fem. *Viridis aut æneus, abdomine antennisque nigris, maris antennis fuscis, pedibus fuscis aut rufis, alis subfuscis aut hyalinis.*

Mas. Viridis, subnitens, subtilissimè punctatus, pubescens: oculi ocellique rufo-fusci: antennæ nigro-fuscæ, pubescentes; articulus 1^{us}. nigro-viridis, nitens: squamulæ nigro-fuscæ: petiolus ater, obscurus, striatus: abdomen nigrum, nitidum, glabrum: pedes rufi, vix pubescentes; coxæ nigrae; trochanteres fusci; femora nigro-fusca, apice rufa; meso- et metatarsi pallidè rufi, apice necnon unguis et pulvilli omnes fusci: alæ subhyalinæ; nervi pallidè fusci; stigma parvum.

Fem. Caput et thorax ænea: antennæ nigrae; articulus 1^{us}. æneo-ater: petiolus æneus: abdomen apice pubescens: pedes fusci; coxæ nigrae; femora nigro-fusca; tibiæ subtus et protibiæ omninò rufæ; tarsi rufi, apice fusci: alæ subfuscae; nervi fusci. (Corp. long. $\frac{1}{2}$ — $1\frac{1}{4}$ lin.; alar. $\frac{2}{3}$ — $1\frac{2}{3}$ lin.)

Var. β.—*Mas.* metatibiæ fusco fasciatæ.

Var. γ.—*Mas.* thorax viridi-æneus.

Var. δ.—*Mas.* caput et thorax ænea.

Var. ε.—*Mas.* profemora rufa.

Var. ζ.—*Mas.* antennæ rufo-fuscæ; articulus 1^{us}. nigro-viridis; clava rufa: pedes rufi; coxæ nigrae; meso- et metatarsi flavi: alæ fulvo-hyalinæ; nervi fulvi.

Var. η.—*Fem.* petiolus ater.

Var. θ.—*Fem.* caput et thorax viridia.

Var. ι.—*Fem.* meso- et metapedum tibiæ nigrae, tarsi nigro-fusci, apice nigri.

Var. κ.—*Fem.* caput et thorax viridi-ænea: protibiæ supra fuscae: alæ subhyalinæ; nervi pallidè fusci.

Var. λ.—*Fem.* meso- et metatibiæ rufæ, fusco fasciatæ.

Var. μ.—*Fem.* femora et tibiæ obscurè rufa; meso- et metatarsi pallidiores, apice fusci.

Var. ν.—*Fem.* caput et thorax viridia: petiolus obscurè viridis: femora et tibiæ pallidè rufa; meso- et metatarsi flavi, apice fusci: alæ hyalinæ; nervi fulvi.

Common near London during the greater part of the year, on box-trees, in the spring. September; Isle of Wight. New Lanark.

GENUS, ISOSOMA, *Walker.*

Sp. 24. *Isos. flavicolle.* Fem. *Nigrum, prothorace pedibusque flavis, his nigro variegatis, alis subhyalinis.*

Isos. fulvicolli similis, differt abdomine alisque longioribus. Nigrum, obscurum, punctatum, pubescens: caput thorace latius: oculi ocellique obscure rufi: mandibulæ rufo-fuscae: antennæ nigræ, pubescentes, thorace breviores; articulus 1^{us}. rufus; 2^{us}. apice fuscus: thorax elongatus, angustus: prothorax flavus, utrinque anticè pallidior, posticè nigro-fuscus, supra fusco vittatus: squamulæ nigro-fuscae: petiolus brevis: abdomen angustum, glabrum, nitidissimum, thorace vix brevius, apice elevatum et supra planum: oviductus subexertus, rufus: pedes rufi; coxæ fuscae; procoxæ flavæ, supra fusco maculatæ; profemora supra ad basin nigra; mesofemora nigra, metafemora fusca, ambæ apice rufa; mesotibiæ nigro-fusco, metatibiæ fulvo latè fasciatæ; meso- et metatarsi pallidè rufi, apice fusci: alæ subhyalinæ, pallidè flavescens; nervi flavi; stigma parvum. (Corp. long. 1 $\frac{1}{2}$ —1 $\frac{3}{4}$ lin.; alar. 2 $\frac{1}{4}$ —2 $\frac{1}{2}$ lin.)

Var. β.—Antennæ articulo 1^o. fusco: trochanteres fusci; femora omnia basi nigra; meso- et metatarsi flavi, apice fusci: alæ vix flavescens.

July; on grass beneath trees; near London.

GENUS SYSTOLE, *Walker.*

Sp. 2. *Syst. platyptera.* Fem. *Nigra, alis subhyalinis.*

Lata, nigra, obscura, punctata, pubescens: caput thorace latius: oculi ocellique obscure rufi: antennæ nigræ, pubescentes, thorace paullo breviores: thorax crassus, ferè gibbus; squamulæ nigræ, nitidæ: petiolus brevissimus: abdomen ovatum, glabrum, nitidissimum, thorace brevius et angustius: oviductus rufus, subexertus: pedes nigri, pubescentes; genua flava; protarsi rufi; meso- et metatarsi flavi, apice fusci: alæ latæ, subhyalinæ; nervus solitus fuscus, ubi costam percurrit crassus; stigma parvum. (Corp. long. $\frac{3}{4}$ lin.; alar. 1 $\frac{1}{4}$ lin.)

July; on grass in fields; near London.

GENUS EURYTOMA, Illiger.

Sp. 12. Eur. acuminata. Fem. *Nigra, tarsi flavis, alis hyalinis. Plerisque hujus generis longior; E. nitida duplo major; E. longipenni et gracili alarum nervis pallidioribus, E. collari capite thoraceque latioribus distincta.*

Nigra, punctata, obscura, pubescens: caput thorace paullo latius: mandibulæ rufo-fuscae: oculi ocellique rufi: antennæ nigræ, thorace breviores, fusco pubescentes; articulus 1^{us}. basi, 2^{us}. apice, 3^{us}. 4^{us}. que omnino fusci: squamulæ rufo-fuscae: petiolus brevis, gracilis: abdomen ferè glabrum, nitidissimum, thoracem longitudine adequans, apice sparsè pubescens; segmentorum margines subtus abdomen fusci: oviductus rufus, subexertus; tegmina nigro-fusca, apice rufa: pedes nigri, pubescentes; trochanteres fusci; genua rufa; tibiæ apice tarsi que flavescentes: alæ hyalinæ, iridescentes; nervi pallide fusci; stigma parvum. (Corp. long. $1\frac{3}{4}$ —2 lin.; alar. $2\frac{1}{4}$ — $2\frac{1}{2}$ lin.)

Taken near Paris, by M. F. de Laporte; and sent to me, as well as many of the following species, with manuscript names, which I have adopted.

Sp. 13. Eur. squamea. Fem. *Nigra, tarsi pallide flavis, alis hyalinis. Præcedenti similis sed paullo crassior; E. verticillata et curta longior.*

Nigra, obscura, punctata, pubescens: caput thorace paullo latius: mandibulæ rufo-fuscae: oculi ocellique obscurè rufi: antennæ nigræ, thorace breviores, fusco pubescentes; articulus 1^{us}. basi rufo-fuscus: squamulæ rufo-fuscae: petiolus brevis, gracilis: abdomen ferè glabrum, nitidissimum, thorace brevius, apice sparsè pubescens: oviductus rufus, subexertus; tegmina nigro-fusca, apice rufa: pedes nigri, pubescentes; trochanteres rufo-fusci; genua flava; tibiæ nigro-fuscae, subtus pallidiores, apice basique rufæ; protibiæ rufæ, supra fusco vittatæ; tarsi pallide flavi: alæ hyalinæ, subiridescentes; nervi fulvi; stigma parvum. (Corp. long. $1\frac{3}{4}$ lin.; alar. $2\frac{1}{4}$ lin.)

Var. β .—Meso- et metatibiæ nigræ, apice basique rufæ.

Taken near Paris, by M. F. de Laporte.

Sp. 14. Eur. rufitarsus. Mas et Fem. *Statura præcedentis, tarsi rufis.*

Mas.—Nigra, obscura, punctata, pubescens: caput thorace paullò latius: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi: antennæ nigræ, fusco-pilosæ, thoracem longitudine adequantes; articulus 1^{us}. basi rufo-fuscus: squamulæ rufo-fuscæ: petiolus mediocris: abdomen thoracis dimidio non longius, glabrum, nitidissimum: pedes nigri, pubescentes; trochanteres et genua rufo-fusca; tibiæ nigro-fuscæ, apice basique protibiæ subtus quoque rufæ; tarsi rufi: alæ hyalinæ, subiridescentes; nervi fulvi; stigma parvum.

Fem.—Antennæ breviores: petiolus brevis, gracilis: abdomen thorace paullò brevius, apice sparsè pubescens: oviductus rufus, subexertus; tegmina nigro-fusca, apice rufa: tibiæ nigræ, subtus fuscæ, apice basique rufæ. (Corp. long. 1½ lin.; alar. 2 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 15. Eur. Salicis. Fem. *Nigra, tarsis flavis, alis hyalinis. Præcedentibus oviductu longiore distincta.*

Nigra, obscura, punctata, pubescens: caput thorace paullò latius: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi: antennæ nigræ, pubescentes, thorace breviores; articulus 1^{us}. basi rufo-fuscus: squamulæ rufo-fuscæ: petiolus brevis: abdomen thorace vix brevius, ferè glabrum, nitidissimum, apice pubescens; segmentorum margines subtus fusci: oviductus rufus, abdominis trientem longitudine adequans; tegmina nigro-fusca, apice rufa: pedes nigri, pubescentes; trochanteres fusci; femora apice rufa; tibiæ fuscæ, subtus apice basique rufæ; tarsi flavi: alæ hyalinæ, subiridescentes; nervi fulvi; stigma parvum. (Corp. long. 1¾ lin.; alar. 2 lin.)

Reared by M. F. de Laporte, from galls on willows, near Paris.

Sp. 16. Eur. flavipes. Mas et Fem. *Nigra, pedibus flavis, alis hyalinis. Statura E. acuminatæ.*

Mas.—Nigra, punctata, obscura, pubescens: caput thorace paullò latius: mandibulæ rufo-fuscæ: oculi ocellique obscurè rufi: antennæ nigræ, pilosæ, apice rufo-fuscæ, thoracem longitudine adequantes; articulus 1^{us}. basi rufus: thorax abdomine ferè duplò longior; squamulæ rufo-fuscæ: petiolus mediocris: abdomen ferè glabrum, nitidissimum: pedes pallidè rufi, pubescentes; coxæ nigræ; pro- et mesofemora basi fusca; metafemora et metatibiæ fusco cingulata; tarsi pallidè flavi: alæ hyalinæ, iridescentes; nervi pallidè fulvi; stigma parvum.

Fem.—Antennæ breviores, pubescentes, apice fuscae: petiolus brevis: abdomen thoracem longitudine adequans, apice sparsè pubescens; segmentorum margines subtus fusci: oviductus rufus, subexertus; tegmina nigro-fusca, apice rufa: pro- et mesotibiæ supra fusco vittatae: metapedes nigri; femora et tibiæ apice basique, nec non tarsi omninò rufa. (Corp. long. $1\frac{1}{2}$ — $1\frac{3}{4}$ lin.; alar. $2\frac{1}{4}$ lin.)

Taken near Paris, by M. F. de Laporte.

GENUS DECATOMA, *Spinola*.

* *Macula stigmatalis sublunaris*.

Sp. 11. Dec. semifasciata. *Fem. Nigra, prothorace flavo bimaculato, antennis fuscis, pedibus flavo cingulatis, alis hyalinis.*

Nigra, obscura, punctata, sparsè pubescens: caput mesothorace paullò angustius: mandibulæ fuscae: oculi rufo-fusci, fulvo plus minusve cingulati: ocelli lætè rufi: antennæ fuscae, subtus flavæ, thoracis dimidio vix longiores; articuli 1^{us}. 2^{us}. et nonnunquam 3^{us}. supra nigro-fusci: prothoracis scutelli latera anticè fulvo maculata: squamulæ rufo-fulvæ: petiolus brevis, gracilis: abdomen thorace brevius, glabrum, nitidissimum, immaculatum, basi rufo-fuscum, subtus et apice sparsè pubescens: oviductus subexertus, omninò rufus: pedes nigri, pubescentes; trochanteres flavi; pro- et mesofemora fusca, subtus et metafemora quoque apice flava; pro- et mesotibiæ flavæ, supra fusco vittatae; metatibiæ nigro-fuscae, apice basique flavæ; tarsi flavi: alæ hyalinæ, iridescentes; macula in proalis prope stigma fusca, abbreviata, sublunaris, ad costam nigra; nervi fulvi; stigma parvum. (Corp. long. $1\frac{1}{3}$ — $1\frac{1}{2}$ lin.; alar. $2\frac{1}{4}$ — $2\frac{1}{2}$ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 12. Dec. flavicollis. *Fem. Nigra, flavo variegata, antennis fuscis, prothorace pedibusque flavis, his nigro variegatis, alis hyalinis.*

Nigra, obscura, punctata, vix pubescens: caput thorace latius, subtus flavescens: oculi ocellique rufi: antennæ fuscae, pubescentes, thorace breviores; clava flava: prothorax omninò flavus: mesothorax anticè flavo 4-maculatus: squamulæ fuscae: petiolus mediocris: abdomen thorace vix brevius, glabrum, nitidissimum,

immaculatum: oviductus rufus, subexertus: pedes flavi; metacoxæ, pro- et mesofemora et protibiæ fusco maculata; metafemora apice nigra; meso- et metatibiæ fuscae, apice basique flavæ; ungues et pulvilli fusi: alæ hyalinæ; macula in proalis prope stigma fusca, abbreviata, sublunaris, ad costam nigro-fusca; nervi fusi; stigma minimum. (Corp. long. $\frac{2}{3}$ lin.; alar. $\frac{3}{4}$ lin.)

July; on grass in woods; near London.

Family TORYMIDÆ.

GENUS TORYMUS, *Dalman*.

A French species, at least thrice the size of *T. obscurus*, has the sutures between the scutum, and the parapsides of the mesothorax quite distinct.

GENUS MONODONTOMERUS, *Westwood*.

Fem.—Caput mediocre, thorace paulò latius: oculi mediocres: mandibulæ ferè rectæ, intùs emarginatæ, apice dentibus 3 vix acutis armatæ: maxillæ elongatæ, intùs apicem versus in lobum productæ: palpi maxillares ferè filiformes; articuli 1^{us}. et 3^{us}. breves, æquales; 2^{us}. 1^o. paulò longior et crassior; 4^{us}. longus, subfusiformis: mentum conicum, basi subquadratum: labium latum, integrum, ^c anticè rotundatum et ciliatum: palpi labiales breves; articulus 1^{us}. mediocris; 2^{us}. parvus; 3^{us}. 1^o. æqualis, ovatus, apice acuminatus: antennæ 13-articulatæ, clavatæ, thorace breviores; articulus 1^{us}. gracilis; 2^{us}. cyathiformis, mediocris; 3^{us}. minimus; 4^{us}. et 6 sequentes æquales, subquadrati, approximati, clava ovata, articulis 2 præcedentibus brevior: thorax elongatus, convexus: prothoracis scutellum magnum, subquadratum: mesothoracis scutum et parapsides maxima, hæ benè determinatæ; scutellum magnum, elongato-ovatum: metathorax mediocris: abdomen sessile, compressum, thorace vix brevius: segmentum 1^{um}. magnum, sequentia breviora: oviductus exertus: metapedes coxis femoribusque magnis, his subtus apicem versus unidentatis.

^c The description of the labium of the *Torymidæ*, in page 115. Vol. I. of the Ent. Mag. is erroneous; it is short and undivided, both in this genus and in *Callimome*. *Perilampus* will form another family.

Sp. 1. Mon. stigma.

Diplolepis stigma . . *Fabr. &c.*

Callimome stigma . . *Ent. Mag.* Vol. I. p. 139. 61.

Sp. 2. Mon. pubescens.

Callimome pubescens. . . *Ent. Mag.* Vol. I. p. 138. 60.

Monodontomerus obscurus . *West. Lond. and Edinb. Phil.*
Mag. Third Series. Vol. II.
p. 443.

Sp. 3. Mon. obsoletus. Fem. *Nigro-viridis, oviductu abdomine brevior, antennis nigris, tibiis tarsis alisque fuscis.*

Ichneumon obsoletus . . *Fabr. Ent. Syst. Suppl.* 230. 218;
Coqueb. Illustr. Icon. I. Tab. 5.
fig. 2.

Diplolepis obsoleta. . . *Fabr. Syst. Piezat.* 150. 10.

Nigro-viridis, obscurus, quasi squameus, pubescens: caput viride: mandibulæ rufo-fuscae: oculi ocellique rufi: antennæ nigrae, pubescentes; articulus 1^{us}. viridi-æneus: prothorax viridis: squamulæ fuscae: abdomen nitens, ferè glabrum, thorace non longius, segmenta basi quasi squamea, apice pubescentia: oviductus rufus, abdomine paullò brevior; tegmina nigra, pubescentia: pedes fusci, pubescentes; coxæ et femora obscurè viridia; tarsi pallidè fusci, apice obscuriores: alæ fuscae; proalæ sub costam obscuriores; nervi fusci; stigma mediocre. (Corp. long. 1 $\frac{3}{4}$ —1 $\frac{1}{2}$ lin.; alar. 2 $\frac{1}{2}$ —2 $\frac{3}{4}$ lin.)

Taken near Paris by M. F. de Laporte.

Sp. 4. Mon. æreus. Fem. *Æneo-viridis, oviductu abdomine multò brevior, antennis nigris, tibus tarsisque rufo-fuscis, alis hyalinis.*

Æneus, parùm nitens, quasi squameus, pubescens: mandibulæ rufo-fuscae: oculi ocellique rufi: antennæ nigrae, pubescentes; articulus 1^{us}. æneus: squamulæ rufo-fuscae: abdomen æneo-viride, ferè glabrum, apice sparse pubescens, thorace non longius; segmenta apice ænea: oviductus rufus, abdominis dimidio vix longior; tegmina nigra, pubescentia: pedes rufo-fusci, pubescentes; coxæ et femora obscurè viridi-ænea; tarsi rufi, sub basi pallidiores, apice obscuriores; alæ hyalinae, iridescentes; nervi

fusci; stigma mediocre. (Corp. long. $1\frac{1}{2}$ — $1\frac{2}{3}$ lin.; alar. $2\frac{1}{4}$ — $2\frac{1}{2}$ lin.)

Var. β .—Caput et prothorax anticè viridi-ænea.

Taken near Paris, by M. F. de Laporte.

GENUS DIOMORUS,^d Walker.

Caput transversum, mediocre: oculi mediocres: antennæ 13-articulatæ, subfiliformes, medio frontis insertæ; articulus 1^{us}. gracilis; 2^{us}. parvus, cyathiformis; 3^{us}. minimus; 4^{us}. et 6 sequentes approximati, subæquales; clava conica, articulis 2 præcedentibus brevior: thorax elongato-ovatus, convexus: prothorax mediocris, anticè angustus: mesothoracis scutum magnum; parapsides conspicuæ, suturis distinctis; scutellum, paraptera et epimera benè determinata: metathorax parvus: abdomen elongato-ovatum, sessile, subcompressum, thorace non longius; segmentum 1^{um}. longum, apice librum: oviductus exertus: pedes graciles, subæquales; coxæ mediocres; metafemora subtus apicem versus unidentata; tibiæ apice spinis armatæ; ungues et pulvilli parvi: nervus solitus ramulum emittens perbreve, apice subfurcatum.

Sp. 1. Dio. nobilis. Fem. *Æneo-viridis, antennis nigris, pedibus rufis, alis hyalinis.*

Viridis, nitens, quasi squameus, sparsè pubescens: caput anticè viridi-æneum: oculi ocellique obscurè rufi: antennæ nigræ, pubescentes; articulus 1^{us}. subtus et basi rufus: mandibulæ flavæ: thoracis segmentorum margines ænei: abdomen subtus fulvescens; latera ænea, cupreo maculata: oviductus corpore brevior: pedes rufi, pubescentes; coxæ virides; metafemora viridia, apice basi-que rufa: alæ subhyalinæ, prope costam paullò obscuriores; nervi fusci; stigma parvum. (Corp. long. $1\frac{3}{4}$ lin.; alar. $2\frac{3}{4}$ lin.)

Taken in Birchwood, by Mr. Davis, the end of July.

GENUS CALLIMOME, Spinola.

Sp. 62. Callim inconstans. Fem. *Lætè viridis, oviductu corpore multò longiore, antennis nigro-fuscis, pedibus stramineis, alis hyalinis.*

Evania Bedeguaris? Cuvier, Silberman. *Revue Ent.* I. 154.

Lætè viridis, nitens, quasi squameus, pubescens: caput thorace vix angustius: mandibulæ rufo-fusæ: oculi ocellique obscurè rufi:

^d δls bis, *Σμωπος* affinis.

antennæ nigro-fuscae, pubescentes; articulus 1^{us}. flavus: caput anticè thoracisque latera æneo-viridia; squamulæ fulvæ: abdomen thorace longius, pubescens, ferè glabrum, apice basique æneo-viride, subtus rufo-fuscum et carinatum; segmenta dorsalia posticè purpureo-cyanea: oviductus corpore multò longior, rufus; tegmina fusca, pubescentia: pedes straminei, pubescentes; coxæ virides, apice flavæ; metafemora flavo cingulata; ungues et pulvilli fusi: alæ hyalinæ; nervi pallidè fusi; stigma minimum. (Corp. long. $1\frac{1}{2}$ — $1\frac{2}{3}$ lin.; alar. $2\frac{1}{2}$ —3 lin.)

Var. β.—Abdominis apex subtus cupreo-æneus.

Var. γ.—Abdomen apice basique viride.

Var. δ.—Metafemora viridi-flavo cingulata.

Taken near Paris, by M. F. de Laporte.

Sp. 63. Callim. lateralis. Fem. *Viridis, oviductu corpore longiore, antennis nigris, pedibus rufis, alis hyalinis.*

Viridis, nitens, quasi squameus, ferè glaber, sparsè pubescens: caput thorace vix angustius: mandibulæ rufo-fuscae: oculi ocellique obscurè rufi: antennæ nigræ, pubescentes; articulus 1^{us}. flavus: thoracis latera viridi-ænea: squamulæ rufæ: abdomen thoracè paullò longius, cupreo-æneum, subtus æneo-viride; segmentum 1^{um}. viride: oviductus rufus, corpore longior; tegmina nigro-fusca, pubescentia: pedes pallidè rufi, pubescentes; coxæ æneo-virides; tarsi pallidè straminei; ungues et pulvilli fusi: alæ hyalinæ, paullò iridescentes; nervi fusi; stigma minimum. (Corp. long. $1\frac{1}{2}$ lin.; alar. $2\frac{1}{2}$ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 64. Callim. rufipes. Fem. *Viridis, oviductu abdomine longiore, antennis nigris, pedibus rufis, alis subhyalinis.*

Viridis, nitens, quasi squameus, pubescens: caput thorace paullò latius: mandibulæ rufo-fuscae: oculi ocellique obscurè rufi: antennæ nigræ, pubescentes; articulus 1^{us}. nigro-viridis, subtus flavus; 2^{us}. æneus: thoracis segmenta æneo submicantia; squamulæ rufæ: abdomen thorace paullò longius, ferè glabrum, cyaneo cupreoque micans, supra et apice æneum, vix pubescens: oviductus rufus, abdomine longior; tegmina nigra, pubescentia: pedes rufi, pubescentes; coxæ virides; tarsi pallidi, apice fusi: alæ subhyalinæ, iridescentes; nervi fusi; stigma parvum. (Corp. long. $1\frac{1}{4}$ lin.; alar. 2 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 65. Callim. compactus. Mas et Fem. *Viridis, oviductu corpore vix longiore, antennis fuscis (mas), aut nigris (fem.), pedibus flavis, femoribus viridibus, alis hyalinis.*

Mas.—Brevis, viridis, nitens, quasi squameus, pubescens: caput thorace vix latius, anticè cupreo-æneum: mandibulæ rufo-fuscae: oculi ocellique rufi: antennæ fuscae, pubescentes; articulus 1^{us}. et 2^{us}. viridi-ænei: thoracis latera cupreo-ænea: metathorax splendide cupreus: abdomen thorace brevius, ferè glabrum, cupreo-æneum, supra viridescens: pedes flavi, pubescentes; coxæ et femora nisi ad apices viridia; trochanteres, tarsi apice, ungues et pulvilli fusci: alæ hyalinæ, iridescentes; nervi fulvi; stigma minimum.

Fem.—Antennæ nigrae, graciliores; articuli 1^{us}. et 2^{us}. viridi-ænei: thoracis latera et metathorax æneo-viridia: abdomen thoracem longitudine adequans, æneo-viride, apice sparsè pubescens: oviductus corpore vix brevior, rufus; tegmina nigro-fusca, pubescentia. (Corp. long. $\frac{3}{4}$ —1 lin.; alar. $1\frac{1}{2}$ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 66. Callim. confusus. Mas. *Cyaneus, abdomine æneo, antennis nigris, tibiis tarsisque fuscis, alis subhyalinis.*

Viridi-cyaneus, nitens, quasi squameus, pubescens, caput mesothorace angustius, anticè viride; vertex purpureo-cyaneus: mandibulæ rufo-fuscae: oculi ocellique obscure rufi: antennæ nigrae, pubescentes; articulus 1^{us}. viridis: thoracis latera viridia; mesothoracis scutum purpureo-cyaneum; squamulæ rufæ: abdomen thorace brevius, cupreo-æneum, ferè glabrum, apice pubescens; segmentum 1^{um}. viride; pedes fusci, pubescentes; coxæ et femora viridia; metacoxæ purpureo-cyaneæ; pro- et mesofemora apice basique fulva; tarsi pallide fusci, apice obscuriores: alæ subhyalinæ, iridescentes; nervi fusci; stigma parvum. (Corp. long. $1\frac{1}{4}$ lin.; alar. 2 lin.)

Taken near Paris, by M. F. de Laporte.

GENUS ORMYRUS, Westwood.

Sp. 3. Orm. tubulosus. Mas et Fem. *Cyaneus, purpureo et cupreo variegatus, abdomine basi nitente, antennis nigris, pedibus plus minusve fuscis, alis subhyalinis.*

Cinips tubulosa. *Fonscol. Ann. Sci. Nat.* XXVI. 290. 18.

Mas.—Cyaneus, parùm nitens, quasi squameus, pubescens: caput thorace non latius, viride, anticè viridi-æneum: mandibulæ rufo-fuscae: oculi ocellique obscurè rufi: antennæ nigræ, pubescentes, apice fuscae, thorace breviores; articulus 1^{us}. æneus: thorax subtus glaber, nitidus: mesothoracis latera posticè et metathorax omninò viridia: squamulæ rufo-fuscae: abdomen thorace paullo longius, nigro-cyaneum, obscurum, punctis magnis confertim sparsum; segmenta apice ænea, læviora; segmentum 1^{um}. viride, apice æneum, nitens, quasi squameum: pedes cyanei, pubescentes; trochanteres fuscii; protibiæ fuscae, subtus rufæ; meso- et metatibiæ nigro-fuscae; tarsi rufo-fusci, apice fusci; meso- et metatarsi basi pallidè rufi: alæ griseo-hyalinæ; nervi fusci; stigma parvum.

Fem.—Caput viride, anticè aureum: thorax viridis, nitens: prothorax posticè, mesothoracis dorsum et metathoracis latera purpurea: abdomen æneo-cupreum, parùm nitens, quasi squameum, thorace multò longius, apice productum, tubuliforme, acuminatum; segmentum 1^{um}. nitens, basi glabrum nitidissimum, apice aureum; 4 sequentia utrinque basi et nonnunquam ferè ad apices cyaneo-viridia, punctata et quasi denticulata: oviductus rufus, non exertus: tibiæ rufæ, supra ad apices fuscae; tarsi 4 postici basi straminei. (Corp. long. 1—2½ lin.; alar. 1½—3¼ lin.)

Var. β.—*Mas*, prothorax viridis.

Var. γ.—*Mas*, mesothoracis scutum cyaneo-purpureum.

Var. δ.—*Mas*, thoracis dorsum et abdomen nisi ad basin purpurea.

Var. ε.—*Mas*, caput anticè et metathorax aurea: prothorax viridis: abdominis segmentum 1^{um}. æneum.

Var. ζ.—*Mas*, caput viride, nitens, quò insident antennæ cyaneum: pro- et mesothoracis dorsum et latera ferè omninò purpurea.

Var. η.—*Mas*, caput et thorace viridia: mesothorax nisi ad scutelli apicem purpureus.

Var. θ.—*Fem.* abdominis segmentum 1^{um}. cupreum, basi æneo-viride.

Var. ι.—*Fem.* prothorax supra cyaneus.

Var. κ.—*Fem.* tibiæ fuscae, protibiæ apice rufæ.

Var. λ.—*Fem.* oculi ocellique lætè rufi: abdomen obscurè cupreum; segmentum 1^{um}. viride; 4 sequentia utrinque basi purpureo-cyanea; meso- et metatibiæ nigro-fuscae.

Reared by M. F. de Laporte, from galls attached to the bark of oak trees near Paris.—A smaller gall found in the

same situations, has produced *O. punctiger*, which is probably parasitic upon *Cynips megaptera*, (Pz.) an inhabitant of the same galls, during its larva and pupa state.

GENUS PERILAMPUS, Latreille.

Sp. 7. Peril. nitens. Fem. *Cyaneo-viridis, antennis nigris, tarsis rufis, proalis latè fusco fasciatis.*

Cyaneo-viridis, nitens, scaberrimus, pubescens : caput anticè et utrinque ferè glabrum ; latera striata : mandibulæ rufæ : oculi fuscæ : ocelli rufo-fuscæ : antennæ nigræ, subtus nigro-fuscæ, fusco pubescentes ; articulus 1^{us}. nigro-viridis, nitidus, apice basique rufo-fuscus : prothoracis latera, mesothoracis paraptera et epimera mesothoracisque scutum et scutellum æneo-viridia : mesothoracis scutellum tuberculatum : squamulæ rufo-fuscæ : abdomen glabrum, nitidissimum, subtus viridi-æneum et pubescens : pedes cyaneo-virides, pubescentes ; genua fusca ; protibiæ subtus rufo-fuscæ ; tarsi rufi ; ungues et pulvilli fuscæ : alæ hyalinæ ; proalæ medio fuscæ ; nervi nigro-fuscæ ; stigma parvum. (Corp. long. $2\frac{1}{4}$ lin. ; alar. $3\frac{1}{2}$ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 8. Peril. antennatus. Mas. *Viridis, abdomine nigro-æneo, antennis nigris crassis, alis subfuscis.*

Obscurè viridis, nitens, scaberrimus, pubescens ; caput anticè et utrinque ferè glabrum ; latera striata : mandibulæ rufæ : oculi fuscæ : ocelli rufo-fuscæ : antennæ maximæ, nigræ, pubescentes ; articulus 1^{us}. nigro-viridis, nitidus : capitis thoracisque latera mesothoracisque scutellum æneo-viridia, hoc tuberculatum : squamulæ rufo-fuscæ : abdomen cupreo-æneum, glabrum, parùm nitidum, sparsè pubescens, apice latè æneum et nitidissimum : pedes virides, pubescentes ; genua rufo-fusca ; protibiæ subtus rufæ ; tarsi rufi : alæ sub-fuscæ ; proalæ sub-costam obscuriores ; nervi nigro-fuscæ ; stigma parvum. (Corp. long. $1\frac{3}{4}$ lin. ; alar. 3 lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 9. Peril. violaceus. Fem. *Viridi-æneus, abdomine cyaneo, antennis^e protibiis tarsisque rufis, alis hyalinis.*

Réaum. Mém. Insect. II. Pl. 37.
fig. 11, 12.?

* *Maris* antennæ nigro-fuscæ.

- Chalcis violacea* *Panz. Faun. Insect.* 88. 15.
Diplolepis violacea . . *Fabr. Syst. Piezat.* 149. 4.
Cynips violacea *Latr. Hist. Nat. des Insect.* XIII.
 222. 3.
Cinipsillum violaceum . *Lam. Anim. sans Vertèbr.* IV. 157.
Perilampus violaceus . *Lat. Gén. Crust. et Insect.* IV. 30.;
 Dalm. Stockh. Trans. 1822. 398.;
 Encycl. Method. X. 66.; *Fonscol.*
 Ann. Sci. Nat. XXVI. 300. 2.
Diplolepis ruficornis . *Fabr. Syst. Piezat.* 149. 1.; *Coqueb.*
 Illustr. Icon. I. Tab. 1. fig. 8.
Cynips ruficornis . . . *Latr. Hist. Nat. des Insect.* XIII.
 222. 2.
Perilampus ruficornis . *Latr. Gén. Crust. et Insect.* IV. 30.;
 Fonscol. Ann. Sci. Nat. XXVI.
 300. 3.

Obs.—*P. nigricornis* and *P. pallipes* are probably only varieties of the male and female of this species.

Obscurè æneo-viridis, parùm nitens, scaberrimus, pubescens: caput anticè et utrinque ferè glabrum; latera striata; frons nigro-viridis: mandibulæ rufo-fuscæ: oculi fusci: ocelli obscurè rufi: antennæ rufæ, pubescentes, apice fuscæ; articulus 1^{us}. ater, nitidus; 2^{us}. fuscus: squamulæ rufo-fuscæ: mesothoracis scutellum tuberculatum: metathorax nigro-viridis: abdomen cyaneum, glabrum, nitidissimum: pedes cyanei, pubescentes; genua rufo-fusca; tibiæ subtus apice fuscæ; tarsi rufi: alæ subhyalinæ; proalæ sub-costam obscuriores; nervi fusci; stigma parvum. (Corp. long. 1½—2 lin.; alar. 2½—3½ lin.)

Var β.—Mesothoracis scutellum nigro-viride: abdominis latera cupreo maculata; protibiæ supra apice et subtus omninò fuscæ.

Var. γ.—Caput supra thoracisque dorsum ænea.

Taken near Paris, by M. F. de Laporte.

Sp. 10. *Peril. auratus*. Fem. *Lætè aureus, thorace pedibusque cyaneis, antennis tarsisque rufis, alis albis.*

Cynips aurata . . . *Pans. Faun. Insect.* 51. 1.

Perilampus auratus . *Dalm. Stockh. Trans.* 1822. 397.

Perilampus chrysis . *Fonscol. Ann. Sci. Nat.* XXVI. 301. 4.

Auratus, nitens, scaberrimus, sparsè pubescens: caput ferè glabrum, anticè et utrinque cupreo-auratum; latera striata: mandibulæ

rufo-fuscae: oculi fusci: ocelli obscurè rufi: antennae rufae, vix pubescentes; articulus 1^{us}. viridis, nitidus; 2^{us}. fuscus: thorax cyaneus: pro- et mesothorax viridi, hic quoque purpureo variegati: squamulae rufo-fuscae: mesothoracis scutellum tuberculatum, apice bidentatum: abdomen glabrum, nitidissimum, apice aureo-viride: pedes cyanei, pubescentes; femora purpureo notata; genua rufo-fusca; tibiae aeneo-fuscae, apice et subtus pallidiores; tarsi rufi: alae albo-hyalinae; nervi pallidè fusci; stigma parvum. (Corp. long. 1 $\frac{1}{2}$ lin.; alar. 2 $\frac{1}{2}$ lin.)

Taken near Paris, by M. F. de Laporte.

Sp. 11. Peril. splendidus. Mas et Fem. *Cyaneo-viridis*, thorace cupreo, antennis nigris, tarsis flavis, alis subhyalinis.

Diplolepis Italicus . . . Panz. Faun. Insect. 100. 16.

Perilampus splendidus . . . Dalm. Stockh. Trans. 1822. 397.

Perilampus Italicus . . . Fonscol. Ann. Sci. Nat. XXVI. 300.

Evania cocorum . . . Cuvier. Silbermann, Revue Ent. I. 153.

P. Italico simillimus, cyaneus, nitens, scaberrimus, pubescens: caput viridi-cyaneum, anticè et utrinque ferè glabrum; latera striata; frons viridis: mandibulae rufo-fuscae: oculi fusci: ocelli obscurè rufi: antennae nigrae, pubescentes; articuli 1^{us}. et 2^{us}. virides, glabri: thorax splendide cupreus, subtus obscurior; squamulae rufo-fuscae: mesothoracis scutellum tuberculatum, apice bidentatum; metathorax viridis: abdomen glabrum, nitidissimum, subtus aeneo-viride, apice cyaneo-viride et pubescens, *maris* basi nigro-cyaneum: pedes viridi-cyanei, pubescentes; genua fusca; tibiae nigro-virides, subtus et apice rufo-fuscae; tarsi rufi: alae subhyalinae; proalae sub-costam obscuriores; nervi fusci; stigma parvum. (Corp. long. 1 $\frac{3}{4}$ —2 lin.; alar. 2 $\frac{3}{4}$ —3 $\frac{1}{4}$ lin.)

Var. β .—Fem. caput viride, anticè cupreum: abdomen viride, subtus cupreum: femora aeneo-viridia.

Taken near Paris, by M. F. Laporte.

Sp. 12. Peril. laevifrons. Mas et Fem. *Nigro-aeneus*, antennis nigro-fuscis, tarsis rufis, alis hyalinis.

Perilampus laevifrons . . . Dalm. Stockh. Trans. 1822. 399.

Nigro-aeneus, parùm nitens, scaber, sparsè pubescens: caput nigrum, anticè nigro-aeneum glabrum nitidissimum: mandibulae rufo-fuscae: oculi ocellique obscurè fusci: antennae graciles, pubescentes, nigro-fuscae, apice subtus pallidiores; articulus 1^{us}. nigro-aeneus,

nitidus: squamulæ rufo-fuscae: mesothoracis scutellum tuberculatum: abdomen glabrum, nitidissimum: pedes nigro-virides; trochanteres fusci; tibiæ apice et subtus rufo-fuscae; tarsi rufi: alæ hyalinæ: nervi fusci: stigma parvum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. 2— $2\frac{1}{2}$ lin.)

Taken near Paris, by M. F. de Laporte.

Family MISCOGASTERIDÆ.^f

GENUS DIPARA, *Walker*.

Nervus solitus costam per omnem per ejus longitudinem percurrentis non ut *Chalciditum* plerisque basi subcostalis.

Sp. 2. Dip. cinetoïdes. Mas. *Atra, antennis nigro-fuscis, petiolo pedibusque flavis, alis pallidè fulvis.*

D. petiolato nimis affinis; statura multò majore, abdomine longiore differt: ater, parùm nitens, subtiliter punctatus: oculi ocellique obscurè rufi: antennæ nigro-fuscae; articulus 1^{us}. omninò, 2^{us}. apice, 3^{us}. que basi subtus flavi: mesothoracis paraptera magna: metathorax scaber, non canaliculatus: petiolus flavus, apice crassior, abdominis dimidio paullò longior: abdomen ovatum, nitidum, glabrum; segmentum basale maximum, ejus dimidium occupans; sequentia parva, subæqualia: pedes omninò flavæ; metacoxæ elongatæ: alæ pallidè fulvæ, ciliatæ; nervi fulvi; stigma parvum. (Corp. long. 1 lin.; alar. $1\frac{2}{3}$ lin.)

Taken near Darlington, in Durham, by the Rev. G. T. Rudd, who observed to me that the abdomen was formed as in *Cinetus*, which it also resembles in some other characters, but has most affinity to the *Chalcidites*.

GENUS MERISUS,^g *Walker*.

Fem.—Caput magnum, thorace latius: oculi mediocres: antennæ 12-articulatæ, subfusiformes, thorace breviores; articulus 1^{us}. gracilis; 2^{us}. brevi-cyathiformis; 3^{us}. et sequentes ad 9^{um}. paulatim graciliores; clava acuminata, articulis 2 præcedentibus paullò longior: thorax elongatus: prothoracis scutellum magnum, subquadratum: mesothoracis scutum magnum; parapsidium suturæ vix conspicuæ; scutellum convexum, ovatum: meta-

^f The name *Miscogaster* (Ent. Mag. Vol. I. p. 458.) must fall; the genus had already been described by Mr. Westwood (Magazine of Nat. Hist. No. XXXII. p. 121.) under the name of *Lamprotatus*.

^g μέγος pars, ἴσος æqualis.

thoracis scutellum magnum: petiolus brevissimus, latus: abdomen elongato-ovatum, convexum; segmentum 1^{um}. mediocre; 2^{um}. breve; 3^o ad 5^{um}. longitudine crescentia; 6^{um}. 5^o. paullo brevius: oviductus non exertus: pedes simplices; coxæ parvæ; femora subclavata; tibiæ rectæ; tarsi graciles; ungues et pulvilli parvi: alæ mediocres; nervus solitus simplex; stigma vix bifurcatum.

Sp. 1. Mer. splendidus. Fem. *Cyaneo-viridis, abdomine purpureo-æneo, antennis fuscis, pedibus stramineis, alis albis.*

Viridis, nitens, quasi squameus: caput cyaneo-viride: oculi ocellique obscurè rufi; antennæ fuscae, subtus et apice flavæ: squamulae flavæ: abdomen purpureo-æneum, nitidum, glabrum, sparsè pubescens: segmentum 1^{um}. viride; sequentia apice cyanea: pedes straminei; coxæ virides; trochanteres fusco maculati; femora viridi fasciata; tarsi apice fulvi; ungues et pulvilli fusci: alæ albæ; nervi flavi; stigma parvum. (Corp. long. 1½ lin.; alar. 2 lin.)

July; south of France.

Family ORMOCERIDÆ.

Corpus multiforme: caput transversum, nonnunquam anticè subproductum: oculi mediocres, laterales: ocelli supra verticem trigonè dispositi: os parvum: mandibulæ subquadratae, sæpe dissimiles: maxillæ elongatae, graciles, subarcuatae, intus apicem versus in lobum productae: palpi maxillares articulis 4; 1^{us}., 2^{us}. et 3^{us}. subæquales; 4^{us}. longior: mentum obconicum, aut ferè rotundum: labium fissum; latera apice convenientia: palpi labiales 3-articulati, breves, lati; articulus 1^{us}. mediocris; 2^{us}. brevior; 3^{us}. longior: antennæ 12-13-articulatae, frontis basi insertae, plus minusve moniliformes; articulus 1^{us}. longus, gracilis; 2^{us}. brevis, cyathiformis; 3^{us}. et 4^{us}. minimi: thorax ovatus: pro- et metathorax parvi: pectus parvum: abdomen sessile, sæpe compressum, plerumque longius quàm latum, supra planum, fem. subtus carinatum; segmenta ventralia vix conspicua: pedes simplices, subæquales; coxæ parvæ; tibiæ rectæ, apice spinis armatae; tarsi graciles, apice spinis armati, articuli 1^o. ad 4^{um}. longitudine decrescentes, 5^{us}. 4^o. longior; ungues et pulvilli parvi: alæ plerumque latae; nervus solitus costam ante alæ medium attingens et mox ramulum stigmaticalem sat longum emittens: metalæ nervo unico, simplici, subcostali, costæ medium attingente.

Sp. 2. Orm. simplex. Mas. *Viridis aut cyaneo-viridis, abdomine cupreo, antennis nigro-fuscis, pedibus viridibus, alis hyalinis.*

Cyaneo-viridis: oculi ocellique obscurè rufi: antennæ subfiliformes, nigro-fuscae; articuli 1^{us}. et 2^{us}. nigro-virides: thorax nitidus, ferè glaber; mesothoracis scutellum obscurè cupreum: abdomen cupreum, viridi marginatum: pedes virides; trochanteres, protibiae et protarsi fusca; genua flava; meso- et metatarsi straminei, apice fusci: alæ hyalinæ; nervi fusci; stigma parvum. (Corp. long. $\frac{3}{4}$ lin.; alar. $\frac{3}{4}$ lin.)

Var. β .—Viridis: abdomen cupreum, basi viride.

June; on grass in woods; near London. New Forest, Hampshire.

Sp. 3. Orm. vernalis. Fem. *Viridis, thorace posticè abdomineque cupreis, antennis nigris, pedibus viridibus, alis subfuscis, proalis fusco maculatis.*

Viridis, nitens: oculi ocellique obscurè rufi: mandibulæ subarcuatæ, breves; una tridentata, dente externa arcuata acuta, interna lata obtusa; altera 4 dentata, dentibus omnibus acutis: antennæ nigrae, clavatae, corporis dimidio breviores; articulus 1^{us}. viridis: mesothoracis scutum et parapsides cupreo vittata; scutellum, paraptera, epimera et metathorax omninò cuprea: abdomen purpureo-cupreum, basi cupreo-viride: pedes virides; trochanteres et genua fusca; tarsi nigri: alæ subfuscae; proalæ maculæ magna oblonga subcostali; nervi fusci; stigma parvum; metalæ nervo apicem versus crasso, pallido. (Corp. long. $\frac{3}{4}$ —1 lin.; alar. 1—1 $\frac{1}{2}$ lin.)

Var. β .—Mesothoracis vittæ diffusæ, vix distinctæ.

Var. γ .—Proalarum maculæ bipartitæ.

Var. δ .—Abdomen viridi-æneum.

Var. ϵ .—Thorax omninò viridis: proalarum maculæ ferè obsoletæ.

Sp. 4. Orm. maritimus. Fem. *Viridi-cupreus, antennis nigris, pedibus nigro-fuscis, alis fuscis.*

Viridi-cupreus, punctatus, obscurus: oculi ocellique obscuri rufi: antennæ nigrae; articulus 1^{us}. nigro-æneus: mandibulæ similes, subarcuatæ, apice dentibus 4 acutis armatae: metathoracis scutellum tuberculatum: abdomen cupreum, glabrum, nitens, basi angustum; segmentum 1^{um}. viridi fasciatum: pedes nigri, pubes-

centes; coxæ nigro-virides; femora rufo-fusca; tarsi fusci: alæ fuscae, proalæ sub costa obscuriores; nervi fusci; stigma parvum. (Corp. long. 1—1½ lin.; alar. 1½—2 lin.)

Var. β.—Abdomen apice viride.

On plants by the sea-shore; June, near Lymington, in Hampshire; September, Isle of Wight.

GENUS II.—MICRADELUS,ⁱ *Walker.*

Corpus triplò longius quam latum: caput mediocre, thorace non latius: antennæ 12-articulatæ, corporis dimidio paullò breviores, clavatæ, apice acuminatæ, pubescentes; articuli 5^o. ad 9^{um}. subcyathiformes; clava acuminata, articulis 2 præcedentibus longior et latior: thorax convexus: mesothoracis scutum magnum; parapsides benè determinatæ, suturis distinctis; paraptera et epimera magna; scutellum magnum, semi-ovatum: abdomen breve, ferè rotundum: oviductus non exertus: nervus solitus ante costam attingit nervulum rejiciens brevem; stigma nervulum brevem emittens.

Sp. 1. *Mic. rotundus.* Mas et Fem. *Ater, antennis pedibusque nigris, alis fuscis.*

Ater, nitidus, ferè glaber: oculi ocellique obscurè rufi: antennæ nigrae, *fem.* crassæ: abdomen *maris* brevi-ovatum, *fem.* subrotundum: pedes nigri; genua fusca; *fem.* progenua flava; tarsi *maris* nigro-fusci, *fem.* fusci apice obscuriores: alæ fuscae; nervi obscuriores; stigma parvum. (Corp. long. ½—¾ lin.; alar. ½—¾ lin.)

September; Isle of Wight.

GENUS III.—GLYPHE,^k *Walker.*

Fem.—Caput mediocre, thorace vix latius: antennæ 12-articulatæ, corporis dimidio non longiores, subclavatæ, pubescentes, submoniliformes; articuli 5^o. ad 9^{um}. subæquales, discreti; clava articulis 2 præcedentibus longior et multò latior, ovata, apice acuminata: mandibulæ dissimiles; una arcuata, dentibus 4 acutis armata; altera ferè recta, inermis: pro- et metathorax minimi:

ⁱ μικρὸς parvus, ἄδηλος obscurus.

^k γλυφῆ, sculptura.

mesothoracis scutum maximum; parapsides optimè determinatæ, valdeconvexæ; scutellum magnum, convexum: abdomen elongato-ovatum, subcompressum, apice acuminatum, inerme; segmenta subæqualia: oviductus non exertus: alæ amplæ; stigma nervulum brevissimum emittens.

Sp. 1. Gly. autumnalis. Fem. *Æneo-viridis, antennis fuscis, pedibus stramineis, alis hyalinis.*

Æneo-viridis, nitida, ferè glabra: oculi ocellique obscurè rufi: antennæ fuscae, corporis dimidio non longiores; articulus 1^{us}. rufus: thorax posticè cupreo-æneus: abdomen thorace longius et angustius: pedes straminei; coxæ æneo-virides; femora viridia, apice basique straminea; tarsi apice nigro-fusci: alæ hyalinæ; nervi fulvi; stigma parvum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. $1\frac{3}{4}$ —2 lin.)

October; on flowers of the ivy; near London.

GENUS IV.—GASTRANCISTRUS, *Westwood.*

Caput plerumque thorace latius, anticè subproductum: *maris* antennæ 13-articulatæ, corporis dimidio longiores, moniliformes, latæ, apice acuminatæ; articuli 6°. ad 10^{um}. subæquales, discreti; clava valdè acuminata, articulis 2 præcedentibus vix longior: *fem.* antennæ paullò breviores, 12-articulatæ, subclavatæ, submoniliformes; articuli 5°. ad 9^{um}. subæquales, vix discreti; clava conica, articulis 2 præcedentibus longior et latior: mandibulæ similes, subarcuatæ, apice dentibus 4 parvis acutis armatæ: thorax convexus; mesothoracis scutum magnum; parapsides optimè determinatæ; paraptera et epimera magna, trigona; scutellum magnum, angustum: *maris* abdomen subcompressum, thorace paullò brevius et angustius, sublineare, apice latius, supra basin versus canaliculatum; segmenta subæqualia: *fem.* abdomen thorace paullò longius, acuminatum, apice supra cornu minuto armatum; latera elevata: oviductus plus minusve exertus: alæ latæ; nervus solitus ante costam attingit nervulum rejiciens brevissimum; stigma nervulum brevissimum emittens.

Sp. 1. Gast. fuscicornis. Mas. *Ater, antennis fuscis, pedibus flavis fusco cingulatis, alis hyalinis.*

Æneo-ater, nitidus, ferè glaber: caput magnum: oculi ocellique obscurè rufi: antennæ fuscae; articulus 1^{us}. ater, basi apiceque

fuscus : metathorax obscure viridis : abdomen subcompressum, basi obscure viride : pedes flavi ; coxæ nigræ ; femora nigro-fusco fasciata ; metafemora nigro-fusca, basi apiceque flava ; metatibæ fusco fasciatæ ; tarsi apice fusci : alæ hyalinæ ; nervi nigro-fusci ; stigma parvum. (Corp. long. $\frac{1}{2}$ — $\frac{2}{3}$ lin. ; alar. $\frac{2}{3}$ — $\frac{3}{4}$ lin.)

Var. β .—Femora omnia nigro-fusca, basi apiceque flava.

Var. γ .—Pro- et mesotibæ fulvæ, basi apiceque flavæ.

June and July ; on grass beneath trees ; near London.

Sp. 2. Gast. compressus. Mas. *Obscurè viridis, antennis fuscis, pedibus flavis, femoribus nigris, alis hyalinis.*

Obscurè viridis, nitidus, ferè glaber : caput magnum : oculi ocellique obscure rufi : antennæ fuscæ ; articulus 1^{us}. obscure viridis : mesothoracis scutellum viridi-æneum : abdomen æneum, basi viride, valdè compressum : pedes flavi ; coxæ virides ; trochanteres fusci ; femora nigra, apice flava ; protarsi fulvi ; meso- et metatarsi straminei, apice fulvi : alæ hyalinæ ; nervus solitus fuscus, ubi costam percurrit latus ; stigma parvum. (Corp. long. $\frac{2}{3}$ — $\frac{3}{4}$ lin. ; alar. $\frac{3}{4}$ —1 lin.)

Var. β .—Mesothoracis scutellum cupreo-æneum.

Var. γ .—Pro- et mesofemora flava, subtus per longum nigro maculata.

Var. δ .—Abdomen basi cyaneo-viride.

June ; on grass beneath trees ; near London.

Sp. 3. Gast. tenuicornis. Mas et Fem. *Æneo-viridis, antennis fuscis, pedibus flavis fusco cingulatis, alis subfuscis.*

Mas.—Obscurè æneo-viridis : oculi ocellique rufi : antennæ fuscæ, subtus flavæ ; articulus 1^{us}. nigro-viridis ; 2^{us}. nigro-fuscus : pedes flavi ; coxæ nigro-virides ; femora fusca, apice basique flava ; metatibæ fuscæ ; tarsi apice fusci : alæ subfuscæ ; nervi fusci ; stigma mediocre.

Fem.—Obscurè viridis ; metathorax nitidior : abdomen obscure æneum, basi viride : antennæ nigro-fuscæ ; articulus 1^{us}. niger : oviductus brevis. (Corp. long. $\frac{1}{2}$ lin. ; alar. $\frac{2}{3}$ lin.)

Var. β .—Mas, caput mesothoracisque latera viridia : pro- et mesotibæ fusco-fulvæ.

May ; on grass beneath trees ; near London.

Sp. 4. Gast. vagans. Fem. *Æneo-viridis, antennis pedibusque fuscis, his viridi flavoque variegatis, alis subhyalinis.*

Gastrancistrus vagans. *Westwood, Lond. and Edinb. Phil. Mag.* Third Series. Vol. II. No. XII. p. 444.

Caput viride, mediocre, thorace vix latius: oculi ocellique rufi: antennæ fuscae; articulus 1^{us}. viridis aut viridi-fuscus; 5^{us}. et 4 sequentes breves, cyathiformes; clava articulis 2 præcedentibus paullo longior et multo latior: mesothoracis scutellum obscure cupreum: abdomen compressum, cupreo-æneum, nitens, basi æneo-viride, apice cornu brevi setigero armatum: oviductus abdominis dimidio longior, fulvus; tegmina nigro-fusca: pedes fuscis; coxæ virides; femora viridi latè cingulata; pro- et mesotibiæ flavæ; tarsi flavi, apice fuscis: alæ subhyalinæ; nervi pallidè fuscis; stigma parvum. (Corp. cum ovid. long. $\frac{3}{4}$ —1 lin.; alar. $\frac{3}{4}$ —1 lin.)

Var. β .—Meso- et rariùs protibiæ fusco-cingulatæ.

Var. γ .—Thorax anticè viridis: abdomen viride, apice æneum.

Var. δ .—Thorax æneus; mesothoracis scutellum obscure cupreum.

May; on grass in woods; near London.

Sp. 5. Gast. viridis. Fem. *Viridis, antennis nigro-fuscis, pedibus flavis viridi fuscoque variegatis, alis subhyalinis.*

Lætè viridis; oculi ocellique rufi: antennæ nigro-fuscae; articulus 1^{us}. nigro-viridis: pedes fuscis; coxæ virides; femora viridia, basi apiceque flava; tarsi flavi, apice fuscis: abdomen compressum: oviductus abdominis dimidio longior: alæ subhyalinæ; nervi fuscis; stigma mediocre. (Corp. long. $\frac{3}{4}$ lin.; alar. $\frac{3}{4}$ lin.)

Var. β .—Mesothoracis scutellum basi viridi-æneum.

Taken near Darlington, in Durham, by the Rev. G. T. Rudd.
May; on grass in woods; near London.

Sp. 6. Gast. atro-purpureus. Mas. *Atro-purpureus, antennis nigro-fuscis, pedibus fuscis, alis subhyalinis.*

Caput magnum, thorace latius: oculi ocellique obscure rufi: antennæ nigro-fuscae; articulus 1^{us}. ater: abdomen subcompressum: pedes nigro-fuscis; coxæ nigrae; femora basi genuaque flava;

tarsi fusci : alæ subhyalinæ ; nervi fusci ; stigma mediocre.
(Corp. long. $\frac{2}{3}$ lin. ; alar. $\frac{1}{3}$ lin.)

June ; on grass beneath trees ; near London.

Sp. 7. *Gast. laticornis*. Mas et Fem. *Cupreo-ater, viridi variegatus, antennis nigro-fuscis, pedibus fuscis, alis subfuscis*.

Mas.—Caput æneo-atrum : oculi ocellique obscurè rufi : antennæ nigro-fuscæ ; articulus 1^{us}. ater : thorax obscurè viridis ; dorsum cupreo-atrum : abdomen nigro-æneum, basi obscurè viride : pedes fusci ; coxæ nigræ ; femora nigro-fusca, apice flava ; tarsi fusci, ante apices plus minusve flavi : alæ subfuscæ ; nervi fusci ; stigma parvum.

Fem.—Obscurè cupreo-ater : abdomen basi viride : oviductus abdomine triplo brevior : protibiæ flavo-fuscæ ; tarsi omnino fusci. (Corp. long. $\frac{2}{3}$ — $\frac{1}{2}$ lin. ; alar. $\frac{1}{3}$ lin.)

June : on grass beneath trees ; near London.

Sp. 8. *Gast. tenebricosus*. Mas. *Æneus, antennis nigris, pedibus alisque fuscis*.

Oculi ocellique obscurè rufi : antennæ nigræ ; articulus 1^{us}. nigro-æneus : mesothorax disco cupreo-æneo, anticè utrinque et metathorax virides : abdomen compressum, basi viride : pedes fusci ; coxæ et femora nigro-viridia ; genua flava, tarsi flavi, apice fusci : alæ fuscæ ; nervus solitus obscurior, ubi costam percurrit latus ; stigma mediocre. (Corp. long. $\frac{2}{3}$ lin. ; alar. $\frac{1}{3}$ lin.)

June ; on grass beneath trees ; near London.

Sp. 9. *Gast. fumipennis*. Mas et Fem. *Viridis, abdomine æneo, antennis nigris, pedibus plus minusve fuscis, alis fuscis*.

Viridis : oculi ocellique rufi : antennæ nigræ ; articulus 1^{us}. viridis, basi fulvus : thoracis segmentorum margines æneo-virides : *maris* abdomen apice pilosum ; segmenta basi medioque omnino ænea ; latera basi cyaneo-viridia : *fem*. abdomen viride : oviductus subexertus : pedes fulvi ; coxæ virides ; *maris* femora nigro-fusco cingulata ; *fem*. femora nigro-viridi cingulata ; tarsi fusci, basi fulvi, apice nigri : alæ fuscæ ; nervi nigro-fusci ; stigma mediocre. (Corp. long. $\frac{2}{3}$ — $\frac{1}{2}$ lin. ; alar. $\frac{1}{3}$ —1 lin.)

Var. β.—*Mas*, lætè cyaneo-viridis : abdomen æneo fasciatum : femora viridi-fusco fasciata ; genua flava.

Var. γ.—*Mas*, lætè cyaneo-viridis ; mesothoracis scutellum et paraptera ænea : abdomen basi et apice æneo-viride.

Var. δ.—*Mas*, abdomen viridi-æneum, basi lateribusque cyaneo-viridibus ; tibiæ fusco-cingulatæ ; tarsi omninò fusci.

Var. ε.—*Mas*, viridis : capitis vertex thoracisque discus viridi-ænei : abdomen indistinctè æneo fasciatum : pedes fusci ; femora fulva, nigro-viridi fasciata.

June ; on grass beneath trees ; near London.

Sp. 10. *Gast. unicolor. Mas. Viridis, antennis nigris, pedibus flavis, alis subfuscis.*

Viridis, unicolor : oculi ocellique rufi : antennæ nigræ ; articulus 1^{us}. fuscus, apice niger : mandibulæ flavæ : abdomen apice pilosum : pedes flavi ; coxæ virides ; ungues et pulvilli fusci : alæ subfuscae ; nervi fusci ; stigma mediocre. (Corp. long. $\frac{2}{3}$ —1 lin. ; alar. $\frac{3}{4}$ —1 $\frac{1}{2}$ lin.)

June ; on grass beneath trees ; near London.

Sp. 11. *Gast. obscurellus. Mas. Viridis, æneo-variegatus, antennis nigris, pedibus fuscis, alis subfuscis.*

Viridis : oculi ocellique rufi : antennæ nigræ ; articulus 1^{us}. nigro-viridis : capitis vertex thoracisque discus ænei : abdomen nigro-æneum, subcompressum : pedes fusci ; coxæ virides ; trochanteres et genua flava ; protibiæ flavæ, supra fuscae ; tarsi fulvi, apice fusci : alæ subfuscae ; nervi fusci ; stigma mediocre. (Corp. long. $\frac{1}{2}$ lin. ; alar. $\frac{2}{3}$ lin.)

June ; on grass beneath trees ; near London.

Sp. 12. *Gast. vulgaris. Mas et Fem. Viridis, antennis nigro-fuscis, pedibus flavis, alis subhyalinis.*

Mas.—*Viridis, nitens*, ferè glaber : oculi ocellique rufi : antennæ nigræ, apice nigro-fuscae ; articulus 1^{us}. nigro-viridis : mesothoracis scutellum æneo-viride : abdomen apice pilosum, æneum, basi apiceque viride : pedes flavi ; coxæ virides ; profemora fusco, mesofemora viridi-fusco, metafemora nigro-viridi cingulata ; metatibiæ fulvæ, basi apiceque flavæ ; tarsi apice fusci : alæ subhyalinæ ; nervi fusci ; stigma mediocre.

Fem.—Antennæ nigræ; articulus 1^{us}. fulvus: mesothoracis discus æneo-viridis: abdomen viride, fasciis indistinctis maculisque lateralibus æneis: oviductus subexertus: pedes flavi; coxæ virides; femora fusco cingulata; ungues et pulvilli fusci. (Corp. long. $\frac{2}{3}$ —1 lin.; alar. $\frac{3}{4}$ —1 $\frac{1}{2}$ lin.)

Var. β.—*Mas*, mesothoracis scutellum viride: abdomen viride; discus æneus: femora omnia viridi-fusco cingulata.

Var. γ.—*Mas*, antennæ omninò nigræ: femora nigro cingulata; metafemora omninò nigra.

Var. δ.—*Mas*, capitis latera posticè ænea.

Var. ε.—*Mas*, mesothoracis dorsum æneum.

Var. ζ.—*Mas*, capitis vertex æneus.

Var. η.—*Mas*, tibiæ omnes concolores.

Var. θ.—*Fem.* antennæ nigro-fuscæ: thorax omninò viridis.

Var. ι.—*Fem.* abdomen viride, æneo per medium vittatum.

May; on grass beneath trees; near London.

Sp. 13. *Gast. terminalis.* *Mas et Fem. Æneo-viridis, antennis nigro-fuscis, pedibus flavis fusco-cingulatis, alis subhyalinis.*

Mas.—Viridis: oculi ocellique obscurè rufi: antennæ nigro-fuscæ; articulus 1^{us}. nigro-viridis: mesothoracis scutum æneo-viride: abdomen subcompressum: pedes flavi; coxæ virides; femora fusco cingulata; tarsi apice fusci: alæ subhyalinæ; nervi fusci; stigma mediocre.

Fem.—*Æneo-viridis*: abdomen viride; discus cupreo-æneus: femora viridi-fusco cingulata: oviductus brevis. (Corp. long. $\frac{2}{3}$ —1 lin.; alar. $\frac{3}{4}$ —1 $\frac{1}{2}$ lin.)

Var. β.—*Fem.* meso-et metatibiæ fusco cingulatæ.

June; on grass beneath trees; Windsor Forest, and near London.

Sp. 14. *Gast. annulipes.* *Fem. Lætè viridis, antennis nigris, pedibus viridibus, tarsis pallidis, alis subhyalinis.*

Oculi ocellique rufi: antennæ nigræ, corporis triente vix longiores; articulus 1^{us}. viridis: oviductus subexertus: pedes virides; trochanteres fusci; genua straminea; tarsi straminei, apice fusci; propedum tibiæ et tarsi fusca: alæ subhyalinæ, quàm præcedentium angustiores; nervi fusci; stigma minimum. (Corp. long. $\frac{1}{2}$ — $\frac{2}{3}$ long.; alar. $\frac{3}{4}$ lin.)

June; on grass beneath trees; Windsor Forest.

Sp. 15. Gast. crassus. Mas. et Fem. *Viridis aut æneo-viridis, antennis nigris aut nigro-fuscis, pedibus flavis viridi et fusco cingulatis, alis hyalinis.*

Mas.—Obscurè cupreum, breve, crassum: caput viride: oculi ocellique obscurè rufi: antennæ nigro-fuscae; articulus 1^{us}. nigro-viridis: pedes flavi; coxæ virides; femora viridi-fusca, apice flava; metatibiæ fuscæ, apice basique flavæ; tarsi apice fusci: alæ subhyalinæ; nervi fusci; stigma parvum.

Fem.—Viridis: antennæ nigræ, corporis dimidio breviores; articulus 1^{us}. nigro-viridis: abdomen cupreo-æneum, basi apiceque viride: oviductus corporis dimidio brevior: femora viridia, apice basique flava: meso-et metatarsi straminei, apice fusci. (Corp. long. $\frac{1}{2}$ — $\frac{2}{3}$ lin.; alar. $\frac{2}{3}$ — $\frac{3}{4}$ lin.)

Var. β.—*Mas*, æneo-viridis: antennæ fuscæ; articulus 1^{us}. viridi-æneus: abdomen cupreo-æneum.

Var. γ. *Mas*, viridis: mesothoracis scutellum æneo-cupreum: abdomen æneo-cupreum, basi viride.

Var. δ.—*Fem.* antennæ nigro-fuscæ: alæ hyalinæ.

Var. ε.—*Fem.* tarsi omnes pallidè fusci, basi flavi.

Var. ζ.—*Fem.* pro- et metatarsi fulvi, apice fusci; mesotarsi straminei, apice fusci.

June to August; on grass in fields; near London.

Sp. 16. Gast. angulus. Fem. *Viridis, antennis nigris, pedibus fuscis, alis hyalinis.*

Viridis, brevis, crassus: oculi ocellique rufi: antennæ nigræ; articulus 1^{us}. nigro-viridis: oviductus abdominis quaterno brevior: pedes fusci; coxæ virides; femora viridi-fusca; tibiæ apice basique flavæ; protibiæ pallidiores: alæ hyalinæ; nervi fusci; stigma mediocre. (Corp. long. $\frac{1}{2}$ lin.; alar. $\frac{2}{3}$ lin.)

June; on grass in fields; near London.

Sp. 17. Gast. acutus. Mas et Fem. *Viridis, antennis nigris, pedibus fuscis, alis subhyalinis.*

Gracilis, elongatus. *Mas.*—Cyaneo-viridis: oculi ocellique rufi: antennæ nigræ; articulus 1^{us}. nigro-viridis, basi fuscus: abdomen subcompressum: pedes fusci; coxæ virides; femora viridia, apice flava: alæ subhyalinæ; nervi fusci; stigma mediocre.

Fem.—Viridis: antennæ clavatæ, corporis triente breviores: abdomen compressum, thorace multò longius: oviductus abdominis

triente brevior: pedes fuscī; coxæ nigro-virides; femora apice flava; tibiæ apice basique flavæ; tarsi fuscī, apice obscuriores. (Corp. long. $\frac{3}{4}$ —1 lin.; alar. $\frac{3}{4}$ —1 lin.)

Var. β .—Fem. Protibiæ subtus flavæ; pro- et mesotarsi basi flavi.

Var. γ .—Fem. Corpus æneo-viride.

Var. δ .—Fem. Pedes flavi; coxæ virides; femora viridi-fusca, apice flava; meso- et metatibiæ fuscæ; tarsi apice fuscī.

June; on grass in woods; near London.

GENUS V. MEROMALUS,¹ Walker.

Mas.—Caput mediocre, thorace paullò latius: antennæ 13-articulatæ, submoniliformes, corporis dimidio multò breviores; articuli 5^o. ad 10^{um}. subæquales, approximati; clava ovata, brevis, articulis 2 præcedentibus brevior et paullò latior: thorax valdè convexus: mesothoracis scutum, paraptera, epimera et scutellum magna, hoc angustum; parapsides optimè determinatæ: abdomen sublineare, subcompressum, thorace angustius sed vix longius; segmenta subæqualia: alæ mediocres; nervus solitus ante costam attingit nervulum rejiciens ferè obsoletum; stigma nervulum brevissimum emittens.

Sp. I. Mer. flavicornis. Mas. *Cyaneo-viridis, antennis pedibusque flavis, alis subhyalinis.*

Cyaneo-viridis, parùm nitens, punctatus: oculi ocellique obscurè rufi: antennæ flavæ; articulus 1^{us}. et 2^{us}. supra pallidè fuscī: abdomen cyaneo-nigrum, nitens, glabrum, basi cyaneo-viride: pedes flavi; coxæ cyaneo-virides; femora subtus fusco vittata; meso- et metatarsi straminei, apice fuscī: alæ subhyalinæ; nervi fuscī; stigma mediocre. (Corp. long. $\frac{5}{4}$ lin.; alar. 1 lin.)

June; on grass in fields; near London.

GENUS VI. RHAPHITELUS,^m Walker.

Mas.—Corpus sublineare: caput mediocre, thorace paullò latius, vix anticè productum: antennæ 12-articulatæ, clavatæ, corporis dimidio breviores; articulus 1^{us}. gracillimus; 5^{us}. et 4 sequentes cyathiformes, lati, approximati; 10^{us}. et 11^{us}. brevissimi, circum articulo 9^o. paullò longiorem et angustioremfingentes; 12^{us}. gracilis, setiformis: mesothoracis scutum latum, planum, maxi-

¹ μέρος pars, μαλὸς tener.

^m ῥαφίς acus, τέλος finis.

num; parapsides scuto in unum confusæ; scutellum magnum, convexum: abdomen subcompressum, thorace paullò longius, apicem versus angustius; segmenta subæqualia: alæ mediocres; stigma nervulum vix conspicuum emittens.

Sp. 1. Rhap. maculatus. Mas. *Viridis, abdomine cyaneo cupreo, antennis nigris, pedibus pallidè fuscis, alis subhyalinis.*

Obscurus, subtiliter punctatus: caput obscurè viride; latera anticè lætè cupreo-iridia: oculi ocellique obscurè rufi: antennæ nigræ; articulus 1^{us}. flavus, apice fuscus; 2^{us}. fuscus: thorax obscurè viridis, posticè obscurè viridi-æneus; latera cyanea: abdomen cyaneo-cupreum, nitens, glabrum, basi æneo-iride: pedes pallidè fuscii; coxæ virides; trochanteres flavi; meso- et metatarsi straminei, apice fuscii: alæ subhyalinæ; proalæ subcosta, fusco maculatæ; nervus solitus fuscus, ubi costam percurrit incrassatus; stigma mediocre. (Corp. long. $\frac{2}{3}$ lin.; alar. $\frac{5}{4}$ lin.)

October; on grass beneath trees; near London.

GENUS VII. PSILONOTUS,ⁿ Walker

Fem.—Caput mediocre, thorace non latius, anticè planum et paullò productum: antennæ 12-articulatæ, subclavatæ, corporis triente non longiores, submoniliformes; articuli 5^o. ad 9^{um}. subæquales, parvi, approximati; clava ovata, articulis 2 præcedentibus paullò latior et longior: thorax planus, depressus: mesothoracis scutum et scutellum maxima, lata; parapsides scuto in unum confusæ; paraptera et epimera parva: abdomen valdè compressum, thorace longius; segmenta subæqualia: alæ mediocres.

Sp. 1. Psil. adamas. Fem. *Viridis, antennis pallidè fuscis, pedibus flavis, alis hyalinis.*

Lætè viridis, glaber, nitidissimus: oculi ocellique rufi: antennæ pallidè fuscae; articulus 1^{us}, et 2^{us}. flavi: caput posticè, mesothoracis scuti latera et metathoracis scutellum cupreo-iridia: abdomen æneo-iride: pedes flavi; coxæ virides; femora nigro-fusco cingulata; metatibiæ fusco cingulatæ; metatarsi apice fuscii: alæ hyalinæ; nervi flavi; stigma parvum. (Corp. long. $\frac{2}{3}$ — $\frac{5}{4}$ lin.; alar. $\frac{3}{4}$ —1 lin.)

Var. β .—Thorax omninò viridis.

June; near London. New Lanark, Scotland.

ⁿ ψιλός glaber, νῶτος dorsum.

ART. XIII.—*Observations on Hesperophilus arenarius and on Zabrus gibbus.* By the REV. G. T. RUDD, M. A. F. L. S.

SIR,—If the following observations are not too trifling for insertion in your valuable Magazine, allow me to beg a corner for them.

Hesperophilus arenarius.—In the summer of 1832, the estuary of the Tees was a favourite collecting locality of mine, as I captured many “good” Coleopterous insects from under the “rejectamenta” of its shores. The river here flows over many hundred acres at high water, but to an inconsiderable depth. On a beautiful day in September, I was enjoying a delightful ramble along the Yorkshire shore,—the breeze was blowing gently from the west: on my return, the tide had *begun* to flow,—it was the first of the spring tides. As I approached the sea, my route being due north, my attention was attracted by observing multitudes of small insects floating before the breeze, and dropping below, and just above, high-water mark—*Hesperophilus arenarius* was the insect. My track was continued for perhaps a mile, and below high-water mark; the flight of *Hesperophili* was also continued, and in such profusion were they, that, at one sweep of my net, I caught as many as filled a large pill-box!

The unusual flight of this burrowing and night-loving beetle, and in such immense numbers, excited my curiosity; I was therefore anxious to pry a little into the matter. Whence did they come? was the first question. To solve this, I changed my line of march, and went due west, towards the flowing tide. I soon walked beyond the point whence these tiny creatures had started; for, after I had proceeded about one hundred yards, not an *Hesperophilus* was to be seen, though, as I advanced, many were on the wing, or crawling from their sandy homes. The fact evidently was, that these insects had all taken flight from a space included between a point some distance below high-water mark and a line drawn at one hundred yards or more parallel to and below it. My curiosity was so far satisfied. But what would become of the multitudes that dropped many yards below

high-water mark, and burrowed into the sand? would they again take wing? or, would they perish, as the flood covered their hiding-place? I waited to see the event. The tide rolled on—covered the sands, with all their inhabitants—and again receded. I disturbed my friends from their retreat;—they were as lively as if they had been sporting in the sunshine, instead of having been under water for more than half an hour!

One point was clear, (confirmed by repeated observations subsequently,) that these Brachelytrous insects have the power of enduring submersion, and under salt water, for at least half an hour.

But why did they leave their burrows at a lower part of the sands? I had previously often collected on this spot, at different periods of the year, during the neap tides, and on the most brilliant days, without having seen a single *Hesperophilus* on the wing. It is fair, therefore, to suppose, either that the extraordinary flight I witnessed was a mere casual occurrence, or that, in some way or other, it is to be accounted for by the state of the tide. On this latter supposition, these insects must have been warned by some peculiar instinct to move higher up the sands, and thereby to avoid submersion for a period that probably would have exceeded their power of endurance. I have to regret that no opportunity of visiting the estuary at the commencement of spring tides has been since afforded me, and I hope that some of your readers will direct their attention to the subject, when they visit any of the larger estuaries, where, no doubt, they will find the insect in profusion. It betrays its lurking-place by the sand it elevates in its burrowing, which dries, and thus leaves a conspicuous mark.

Whilst investigating the habits of *Hesperophilus*, I was accidentally led to detect those of a large species of *Dyschirius*, which occurs in great abundance on the same locality, and which appears to be unnoticed by Dejean. On turning up the sandy tracks, or burrows, *above high-water mark*, to uncover the *Hesperophili*, I found their ferocious enemy, the aforesaid *Dyschirius*, pursuing his work of destruction. These *Dyschirii* burrow after, seize, shake, (as the *Cicindela campestris* does its prey,) and devour the luckless *Hesperophili*: so intent are they on their purpose, that I have

frequently observed them continuing to shake their victim after they were both brought to light.

Zabrus gibbus.—In Vol. I. Part I. pp. 140, 141, of Mr. Stephens's Illustrations of British Entomology, are some remarks "On the supposed Ravages of the Larvæ of *Zabrus gibbus*," and a question is raised as to the food of the perfect insect.

During my residence at Kimpton, near Andover, Hants, an excellent opportunity for investigating this question was afforded me. My curiosity being excited by my friend Mr. Stephens's observations, I gladly and most attentively directed my attention to the inquiry. *Zabrus gibbus* was in profusion at Kimpton, making its appearance generally as the corn came into ear. My brother, Mr. L. Rudd, an indefatigable collecting ally of mine, was on a visit to me in 1828. During one of our rambles, I observed several *Zabri* on the ears of barley, evidently feeding in that situation. I requested my brother to notice most carefully what the beetles were eating; I walked in advance of him some little distance, leaving him to watch the specimen before him. I soon found *Zabrus gibbus* on a barley-stem, eagerly engaged at his repast.

The insect first gnawed off the tip of the husk from the end of the grain, then gradually drew the milky grain out of its sheath, consuming it as it came forth, till the whole grain had disappeared. It repeated the operation, and successively consumed six or seven grains: I then killed, and on my return home, dissected it, when I was most fully satisfied, by this additional proof, that the beetle had fed on the immature corn. My brother knew nothing whatever of my motive for setting him to watch the proceedings of the *Zabrus*, nor even the name of the insect. *His report was minutely the same as mine*. We subsequently paid further and repeated attention to the subject, (without, however, killing the devourer,) and no doubt whatever remained on our minds, that the food of the imago of *Z. gibbus* is the juicy immature grain of barley, and probably also of other grain.

Yours, &c. G. T. RUDD.

Croft, near Darlington,
Jan. 1834.

ART. XIV.—*Entomological Society.*

THIRD SITTING.—JANUARY 6.

THE SECRETARY read a paper by Mr. Lewis, on *Yponomeuta padella*. Mr. Lewis states that the *larvæ* are hatched in the autumn, but remain under the cover with which the eggs are enveloped, till the spring; that on first issuing from this they become mining *larvæ*, and do not spin their web till they have attained a considerable size.

THE SECRETARY read a paper by Mr. Waterhouse, descriptive of several *larvæ*. *Raphidia*, Mr. Waterhouse has ascertained, has an active pupa, as was formerly supposed, not quiescent, as has lately been stated by M. Percheron, in Guérin's *Magasin de Zoologie*, and as was repeated in our last number.

THE SECRETARY read a notice by Mr. Westwood, on the entomological affairs of the Linnæan Society.

MR. NEWMAN read a technical description of *Ripipteryx*, a new genus of Orthoptera. Mr. Newman continued:—The only insect with which I am at all acquainted, that is allied to *Ripipteryx*, is the genus *Tridactylus* of Latreille, but from this, however, it is sufficiently distinct. Of the economy and history of this latter genus, *Tridactylus*, M. Foudras, of Lyons, has lately furnished us with a most complete and interesting account. In the south of France it appears that the *Tridactyli* inhabit the sandy banks of large rivers, which in the summer have been left bare by the diminution of the water: as the water retreats they constantly follow it, always keeping within the limits of its moisture, and if grass, or any vegetable, begins to cover the sand with a coat of verdure, instantly quitting it. They form galleries in the sand, in the same manner as mole-crickets; but what appears most remarkable is, that their food consists of nothing but sand. M. Foudras captured and confined many specimens, and watched them whilst engaged in feeding. He killed and dissected many specimens, and found in the *œsophagus*, and throughout the alimentary canal, no other substance but sand, which was moreover the only ingredient of the excrement.

THE REV. F. W. HOPE exhibited some specimens of *Termites*, or white ants, and *Xylocopæ*, or wood-boring bees,

together with various substances which had been perforated by the former. Mr. Hope also read a technical description of a new Cerambicideous insect, a beautiful drawing of which was exhibited.

Mr. WESTWOOD read some memoranda relating to Insects injurious to beds and books: he exhibited specimens, some of which were excessively minute, and also drawings of them and their ravages.

Mr. SKRIMSHIRE presented some insects.

Mr. HANSON begged to inquire whether it was the intention of the present council to resign their seats on the 27th of the present month, and that a new council should be elected, agreeably to the provision made for that purpose in the by-laws.

The PRESIDENT read a minute of council, by which it appeared that that body intended to sit during the ensuing year.

Mr. J. E. GRAY insisted on the necessity of the present council sitting for another year: the present council must be considered only provisional, until the actual commencement of the business of the Society, and that business was only now beginning: it was also distinctly understood that the subscription now paid was for the year 1834: no one would doubt that it was the first subscription, therefore 1834 must be considered the first year of the existence of the Society, and the first council must manage its affairs for that year.

Mr. DAVIS had heard that at the meeting at which the council was appointed, there were but seventeen or eighteen members present: when he considered that the council consisted of thirteen individuals, and these were appointed out of so small a number, he must look on it as in a good degree a self-elected council; (loud cries of Hear! hear!) that council had sat nine months; the Society now consisted of considerably upwards of one hundred members, and he thought it high time that another council should be elected.

Mr. VIGORS, M.P. said he did not think there was any distinct question before the meeting; he would ask, what was the question? and what was the exact position of the council now sitting? was it a provisional, or a *bonâ fide* council?

The PRESIDENT then read the Proceedings of the Society, by which it appeared the council was not provisional.

Mr. VIGORS then said, he must consider that the present being a *bonâ fide* council, it must resign on the 27th of the present month; and he accordingly moved, That a new council be elected on the 27th inst., in accordance with the spirit as well as the letter of the by-laws.

Mr. LETTS seconded the motion; he said, that from the abstract of the by-laws which he held in his hand, it was compulsory, not optional, for the Society to elect a new council on the 27th of January.

The PRESIDENT then put Mr. Vigors's motion, which was carried by a majority of three-fourths of the members present.

FOURTH SITTING.—JANUARY 27.

At this meeting no other business than the election of a council and officers was transacted. The following is the list:

BELL, THOMAS, Esq. F.R.S. &c.	SPENCE, W. B. Esq. <i>For. Secretary.</i>
CHILDREN, J. G. Esq. <i>Sec. Roy. Soc. &c.</i>	STEPHENS, J. F. Esq. F.L.S. &c.
<i>President.</i>	SYKES, LIEUT.-COL. F.L.S. &c.
GRAY, G. R. Esq.	WESTWOOD, J. O. Esq. F.L.S. &c.
HOPE, REV. F. W. M.A. F.L.S. &c.	<i>Secretary.</i>
<i>Treasurer.</i>	WALKER, F. Esq. F.L.S. &c.
NEWMAN, E. Esq., F.L.S., &c.	WATERHOUSE, G. R. Esq. <i>Curator.</i>
SHUCKARD, W. E. Esq.	YARRELL, W. Esq. F.L.S. &c.

The PRESIDENT, after announcing the result, returned thanks for the honour a second time conferred on him, and expressed his continued desire to serve the Society to the best of his abilities. The conclusion of his speech was warmly cheered.

FIFTH SITTING.—FEBRUARY 3.

The PRESIDENT nominated the Rev. F. W. Hope, Lieut. Col. Sykes, Mr. Stephens, and Mr. Bell, his Vice-presidents, passing an elaborate encomium on each.

The SECRETARY read an abstract of the entomological affairs of the Linnæan and Zoological Societies; at the latter, a paper by Mr. W. S. MacLeay had been read. It related to *Urania*, a genus of butterflies, remarkable for their graceful

and lofty flight; Mr. MacLeay had been successful in breeding this remarkable insect, and now detailed its economy, which proves all that has hitherto been written respecting it to have been incorrect.

The SECRETARY read a paper by Mr. W. Christy, jun., on a species of *Calandra*. Mr. Christy had found this insect in great abundance in the stones of tamarinds, sometimes forty in a single stone; he had in no instance found them alive, and was therefore unable to furnish any facts relating to their economy. He concluded they had perished in the boiling of the fruit, and hoped that some *Rusticus* might hereafter meet with them in their living state, and record their operations.

The SECRETARY read a paper by the Rev. F. W. Hope, technically describing some new genera of *Coleoptera*; drawings were exhibited.

The SECRETARY read a paper by himself, on the nidus, &c. of the gregarious *larva* of a Mexican butterfly; the nidus was exhibited; it was of a tough, leather-like substance, and somewhat bottle-shaped; it contained the pupa-cases of nearly a hundred of the butterflies, all attached by the tail. The Secretary also exhibited the nidus of a wasp, which frequently builds in the orange trees in Demerara.

The SECRETARY read a technical description of some Australian *Phasmata*, by Mr. G. R. Gray; the paper was intended as a supplement to Mr. Gray's splendid monograph of *Phasma*; the species described were exhibited.

The SECRETARY read a paper by Mr. Lewis, containing technical descriptions of some Homopterous *Hemiptera*.

The Rev. F. W. HOPE exhibited to the meeting some insects which had been extracted by Mr. Pettigrew from the skull of a mummy; the skull was now on the table: there were several species, principally of Coleopterous genera—*Dermestes Röëi*, *elongatus*, and *pollinctus*; *Necrobia mumiarum*; and a single elytron of *Pimelia spinulosa*, besides the pupæ and pupa-cases of two Dipterous insects. Mr. Hope observed, that the oldest specimens of insects with which he was acquainted, were in the museum at Leyden, and the age of these did not, he believed, exceed 150 years; but the specimens he was now exhibiting, had probably been in existence three thousand years. He would not, however, take upon himself to state

the precise age of the mummy from which they were taken, especially as Mr. Pettigrew was present, and would, he hoped, favour the meeting with his opinions on the subject.

MR. PETTIGREW.—I don't know that I have any thing to say on the subject, in addition to what Mr. Hope has just told you; but as he has so pointedly called on me, I will just mention, that the date of the commencement and termination of the practice of embalming is involved in so much obscurity, and extends over so considerable a range of time, that I feel great difficulty in assigning an exact age to any individual mummy. I consider, however, the skull, from which the *Necrobæ* and *Dermestides* have been taken, to be Græco-Ægyptian, or Pharaonic; it was brought by Mr. Wilkinson, the celebrated Egyptian traveller, who is now present, from Thebes. I may observe, however, the practice of embalming was continued as late as the fifth century. As I have this opportunity, I will call your attention to a breast-plate, which I hold in my hand, with a representation of a *Copris*; it was purchased by Belzoni of an Arab who had taken it from the breast of a mummy; it is of basalt, and carved in alto-relievo. On one side of the *Copris* is a representation of Isis; on the other, of Osiris; and on the reverse are numerous hieroglyphics. Here is another of the same kind of breast-plate, but composed of common pottery instead of basalt; it was purchased by Mr. Rogers the poet; it bears, like the other, figures of Isis and Osiris, and has also hieroglyphics on the back. I have compared both these with a small tablet of basalt in the British Museum, and have found the figures in all respects the same. I may remark, that the insects exhibited to-night by Mr. Hope, were found in the occipital foramen of the skull. In a skull I have lately examined, there was not the slightest trace of insects, or even of brain; it was perfectly clean; the whole of the brain had been extracted through the left nostril. In another head I found the skull had been fractured; this was evidently the head of a priest. I do not pretend to say how he could come by such rough usage: he had survived this fracture for years; nature had performed a complete cure, by the formation of a layer, or ridge of new bone, along the edges of the fracture, which had firmly united the parts thus unnaturally separated. The cavity of this priest's skull, also, was perfectly clean; not

a vestige of the brain remaining. I have omitted to remark, that the hair of the female skull, now on the table, is in perfect preservation,—very long, and, as my daughter tells me, turned up behind in a manner which, curiously enough, happens to be the fashion of the present day, and is called the “three-plait.”

The SECRETARY. — I think, the insects being found dead proves that the eggs must have been deposited during the process of embalming.

SIXTH SITTING.—MARCH 3.

Among the visitors we observed Captains John and James Ross.

The SECRETARY read a letter from M. Gravenhorst, acknowledging the honour done him by the Society in electing him an honorary member. M. Gravenhorst took the opportunity of calling the attention of the Entomological Society to a work on which he was engaged, “*Monographia Coleopterorum Micropterorum*,” (Genus *Staphylinus*, Linn.)—and of soliciting the loan of undescribed, rare or unique specimens.

[We heartily hope this appeal will not remain unanswered; we shall be happy to afford any assistance in our power to M. Gravenhorst, by charging ourselves with the care and transmission of any specimens that may be sent to us for that purpose.]

The FOREIGN SECRETARY read similar acknowledgments from M.M. De Hahn and Andouin.

The SECRETARY read an Abstract of the Entomological Affairs of the Linnæan and Zoological Societies;—at the latter, a paper, by Mr. W. S. MacLeay, had been read. It related to the genus *Mygale*. Mr. MacLeay has traced the economy of this large spider with great care and perseverance. It is a nocturnal and terrestrial animal, feeding on mole-crickets and other nocturnal insects: it never spins a web of any kind, but simply pursues its prey on foot;—it never catches birds, and will not touch them, even the smallest, if offered; so that the previous history of this creature is entirely fabulous. Mr. MacLeay has seen spiders’ webs of considerable strength, but the birds never get entangled in them, nor do they evince any fear of them; on the contrary, the minute humming-birds are

frequently seen hovering about them, and picking out little flies which have been captured.

The SECRETARY read a paper by the Rev. F. W. Hope on Amber and Copal Insects. Mr. Hope remarked, that, notwithstanding the great age of the mummy-insects exhibited at the last meeting, he had now to submit some infinitely older;—they were at least antediluvian, and probably coëval with the world itself. The specimens found in amber and copal had evidently not been starved or injured, but had been enhumed in a state of health, happiness, and vigour. Amber has been found in many parts of this kingdom, particularly, washed up by the tide on the sea-shore near Aldborough. The amber-tree is not now known, and is supposed to be extinct. The same fact held good with the insects; the forms to which they most nearly approached were entirely extra-European.

The REV. F. W. HOPE rose to make some further remarks on the same subject; he said he had about 150 genera of amber and copal insects in the tables which he had drawn up. The amber-insects he considered of intertropical, the copal, of oriental forms.

The SECRETARY read a paper by Mr. Waterhouse, being a technical description of *Picumnus Hopei*, a large Coleopterous insect of the family *Prionidæ*. An exquisitely beautiful drawing of the insect, by Mr. Curtis, was exhibited.

The SECRETARY read a paper by Mr. Shuckard on Aculeate Hymenoptera. Mr. Shuckard lamented the almost total neglect of this tribe. He excepted however the Bees; on this subject he considered Mr. Kirby's "*Monographia Apum Angliæ*" a complete model, and the most perfect work of the kind ever published. Mr. Shuckard attempted to distinguish between the parasitic and imparasitic aculeates. He considers both these characters to be found in nearly allied genera, and sometimes even in the same genus; of this he gave *Pemphredon* as an instance. He observed that the Parasitic Aculeate Hymenoptera differed from Parasitic *Ichneumonæ* in never being carnivorous; they merely feed on the provision stored up for other *larvæ*, not on *larvæ* themselves.

The PRESIDENT, in calling the attention of the meeting to some insects exhibited by Captain James Ross, must be allowed to make a comment on the presence of that distinguished gentleman, and his uncle, Captain John Ross. These

illustrious men, braving and overcoming every difficulty, had rendered the most important services to commerce, navigation, and science:—they had shown how the whale was to be pursued and captured amid fields of ice, where hitherto he had been secure;—they had fixed the site of the Magnetic Pole, and had added treasures to every branch of natural history.

[The insects were, four butterflies; two of the genus *Colias*, and two *Melitæa*; two bees of the genus *Bombus*, and one Lepidopterous larva.]

The SECRETARY announced that the insects brought by Captain Lyon, from the North Pole, were also on the table for exhibition.

The SECRETARY read a paper by himself on the genus *Arcturus* of Latreille, giving opinions of its affinities. He exhibited several pen-and-ink drawings, and some specimens, in illustration of his views.

The REV. F. W. HOPE exhibited a large *Scarabæus*, from Venezuela, which he believed to be new. He proposed dedicating it to Sir Robert Kerr Porter.

The SECRETARY announced that Mr. Hope was preparing a paper on Monstrosities in Insects; and solicited facts, loan of specimens, &c.

[Any thing sent us by our correspondents for this purpose shall be carefully and immediately forwarded.]

ART. XV.—*Hints relative to the present Plans, and future Prospects, of the Entomological Society.* By WILLIAM SWAINSON, Esq. F.R.S. L.S. &c.

THE experience of ages has sanctioned the aphorism of the wisest of men, that “in a multitude of counsellors there is wisdom;” for, as in the natural world a beautiful landscape must be contemplated from different stations before the painter decides on that which is the most picturesque, and most suited to employ his pencil; so, in the world of mind, great undertakings can never be successfully accomplished, until we have a diversity of opinions, from which we can calmly and dispassionately frame that plan of operations most conducive to the object which all have in view. It is under the influence

of these convictions that I venture to offer to the Entomological Society, and more especially to the consideration of its newly-elected Council, the following hints, as appearing to me well deserving their consideration; and I do this the more readily, since the nature of my scientific occupations, no less than my distance from the metropolis, prevents me from taking that active part in the concerns of our Society which the partiality of several of its members have wished me to do. Nor can I conceive a more fit channel for giving publicity to these hints, than through the *Entomological Magazine*; a publication which has happily concentrated all the floating records of our fascinating science, dissipated, in their details, over the numerous periodicals of the day; and has thus given a strength and impetus to it, which has eventually led to the formation of a Society exclusively devoted to the natural history of annulose animals.

All the advantages resulting from a society or combination of individuals, for the accomplishment of any specific object, may be arranged under three heads:—1st, The facility of union; 2dly, The general advantages to the science; 3dly, The particular advantages resulting to individuals.

1. Under the term *facility of union* is not only comprised those qualifications that are to be possessed by such as desire to become members, but the expense attendant thereon. In both these respects our Society is unexceptionable. There are, indeed, few entomologists to whom the annual payment of one guinea is inconvenient; and by fixing the contribution at so moderate a rate, we, at least, have avoided the reproach cast upon the scientific institutions of this country by foreigners—that they are made only for the wealthy, and are, essentially, composed alone of the aristocracy. Yet small as this sum may be, it is well known that there are very many humble devotees to entomology, particularly in and about the metropolis, to whom, in these times, *any* payment would be inconvenient. Are we, therefore, to hold ourselves aloof from these our poorer brethren, merely because their station in society is inferior to our own? and are we to debar them the advantages of acquiring a taste for scientific entomology, and of an occasional personal intercourse with their more accomplished brethren in the science, merely because their calling in life is below ours, and their pecuniary resources more scanty?

Certainly not. They are fellow-labourers with ourselves in the same vineyard; and on their exertions, in the *practical* part of entomology, will frequently depend the solution of some of the most important questions regarding the higher departments of the science. I cannot but think, therefore, that, following the excellent example of the Linnæan Society, we should open the door of fellowship to these meritorious persons; and, by the institution of ASSOCIATES, enable *every* entomologist, in his respective sphere of life, to become a member of the same scientific body. Associates should be proposed by members, and regularly balloted for. This measure would guard the Society from the obtrusion of improper persons; mutual benefit would result to all parties; and we should concede to them the use of our library and museum, without allowing them to possess any voice in the administration of our affairs.

Another point connected with this division of our subject is, the place and times of meeting,—both involving questions of expense to the Society, and of convenience to its members. From the nature of our union, and the smallness of our annual subscription, we can never hope to possess those pecuniary resources enjoyed by the more wealthy societies of the metropolis. I indulge a confident expectation, therefore, now that our little association has assumed a permanent form, that, through the representation and exertions of our esteemed and liberal-minded President, Government will be induced to extend to us the same indulgence that has been granted to other societies, by assigning to us the use of one of the numerous rooms in Somerset House,—a central situation, admirably adapted, as I should imagine, to the majority of our members; and by which concession our scanty funds would be disburthened from a heavy annual expense. I cannot but be sanguine, that if a proper representation on this subject was made by our excellent President to His Royal Highness, the Duke of Sussex, the latter, as the representative and *protector* of the science of this country, would exert his influence in our behalf.

We come now to the second subject of inquiry, namely, What are the means by which the science, in general, can be *best* promoted by the Entomological Society. Here, as in all similar questions, the means to be employed do not so much

depend upon their abstract nature, as upon the funds we possess for carrying them into execution, and by which we should, as a matter of course, regulate our operations. Science is encouraged, 1st, By the publication of original information; 2dly, By instituting premiums for the best essays upon any given theme; 3dly, By the employment of collectors to gather materials for the investigation of the members; in other words, by the establishment of a museum; 4thly, By the formation of a library; and, 5thly, By devoting funds to the prosecution of such works as, from their nature, cannot be expected to receive encouragement from the public. All these points deserve consideration, inasmuch as each possesses some peculiar advantage. It may be useful, therefore, to make a few observations upon each, first premising, that all parties will assent to the undeniable wisdom of this principle, that if the same object can be accomplished as effectually *without* expense, as it can be done, by a different method, *with* expense, it is our bounden duty to prefer the former; for by so doing, we enable the Society to accomplish much more, by the judicious employment of the funds so saved, than it otherwise could do.

1. The publication of the most valuable essays or papers, sent to a scientific society, is unquestionably one of the best means for promoting its objects; because such a collection may be viewed as the aggregate wisdom of its chief members, although circumstances, hereafter to be adverted to, have very much tended, of late years, to shew that the latter supposition is more visionary than real. Be that, however, as it may, it is plain to all those who know any thing about the matter, that the publication of its Transactions is the most constant and draining expense which can be entailed upon a society; and that even in the case of those who enjoy annual funds to the amount of *thousands*, it absorbs so much, that nothing can be spared for other and equally beneficial objects. In proof of this, I need only cite the present state of the pecuniary affairs of the Royal Society of London, the parent from which nearly all others have sprang; and of the Linnæan Society, the oldest and the best of those more especially devoted to zoological science. The plan of the former has hitherto been to publish a very considerable portion of their communications in a form and style suited (as some imagined) to the *dignity* of the association, as if *that* was dependent upon wire-wove paper,

Bulmer's types, and wide margins. The consequence has been, that this expensive system has exhausted nearly the whole of their funds, to the virtual exclusion of many other objects equally important. Their library, exclusive of presents, is proverbially poor, being deficient in the standard works of modern science: and they are obliged to rely chiefly upon the liberality of the Government for the means of bestowing the annual premiums. I advert to these facts for the purpose, not of disparaging the Society, but to shew the actual working of an old, but injudicious system; a system, moreover, which, if my information be correct, the Society itself is now about to revise and amend, simply from the enormous annual expenditure it entails. If we turn to the Linnæan Society, the same effects are perceptible. Their Transactions, however valuable, completely absorb their funds, and take from them the means of prosecuting, with the least degree of vigour, any one of the objects we shall presently advert to. It might reasonably have been expected, that from so large an income, an annual proportion might have been set aside for the purchase of the Linnæan treasures. By such timely foresight a fund would have been created without the necessity of applying to the members for a large subscription, highly inconvenient to the majority, who, nevertheless, felt, under existing circumstances, the wisdom and urgency of the measure. While speaking of this Society, I must advert to a subject of deep regret to its entomological members, as a disadvantage which more particularly affects them. I allude to the resolution, adopted of late years, by the Council, of not publishing *coloured* plates of insects, solely, as it is understood, from the great expense that attended those immutable figures contained in the twelfth volume. It is not likely that such erudite and invaluable papers will be of frequent occurrence, and the extra expense they would entail might, therefore, well be granted. And, in the next place, the Society, by this ill-judged measure of economy, have raised an insuperable bar to receiving from those few persons capable of furnishing such essays any more of the same description.

Seeing, therefore, that the publication of *Transactions* actually absorbs the greatest portion of the funds enjoyed by our chief scientific bodies, yet, knowing also the great good that results from such publicity and dissemination of modern

discoveries, it remains for us to consider whether, by adopting any other means, we can secure the same advantages, without entailing upon ourselves those evils which are inseparable from the plan just mentioned. And here it is with sincere pleasure that I am enabled to mention the Zoological Society of London in those terms of praise, which, upon every occasion, I should have been most willing to concede to it. Its Council saw the rock upon which others were splitting, and had the prudence and wisdom to avoid it. Far from thinking that the reputation of the Society would be raised in the estimation of the scientific world, or of the public, by the sending forth of an imposing hot-pressed quarto volume of *TRANSACTIONS*, they made use of one of the best of our scientific journals as the channel for communicating, in a condensed form, all that was essential of their scientific labours: and these abstracts, subsequently printed in a detached form, are sold for a mere trifle, and thus become accessible to the poorest student. It is only very lately, at a time, as we may fairly suppose, when the Society have accumulated funds for such an additional expense, that they have commenced a regular volume of *Transactions*, which every one will hail with pleasure, if the alteration does not supersede the admirable plan at first adopted.

It is to this particular subject, more, perhaps, than to any other, that I venture to call the unprejudiced attention of the Society at large, and of the Council in particular, because it appears to me, and to several with whom I have conversed, the only plan which will enable us to act up to the principle we set out with considering as an axiom, namely, that if the same object can be accomplished as effectually *without* expense, as it can be done, by a different method, *with* expense, it is *our bounden duty to prefer the former*.

Let us, however, upon such an important and interesting question, go a little deeper into the matter, and putting aside both theory and general experience, come to calculations, estimates, and figures. Suppose, then, we decided upon publishing our *Transactions*, and that they appeared in octavo parts (for we could hardly aspire to a quarto) every three months. We could not bring out a *thinner* pamphlet, or at a *higher* price, than one of the numbers of this magazine; nor could a less number be printed than 250 copies. Having had some

experience in these matters, I shall now lay before the reader an estimate of the cost of such a number.

	£	s.	d.
Cost of paper and printing, correcting and advertising, 250 copies, size of <i>Entomological Magazine</i> , about	27	0	0
Cost of three plates, (drawing, engraving and colouring), five figures in each	31	15	0
	<hr/>		
	58	15	0
Sale of 250 copies, at 2s. 9d.	34	7	6
	<hr/>		
Net loss per number	24	7	6
	<hr/>		
Or on four quarterly numbers	97	10	0
	<hr/> <hr/>		

This estimate, be it observed, is a most favourable one; for it is made on the supposition that every copy will be sold, which no one, at all acquainted with the present rage for the "penny press" would expect. And yet, on this shewing, the publication would entail upon the Society a loss of 97*l.* 10*s.* per annum,^a its present income being 105*l.* I must confess, that, in my estimation, no folly is greater than that which we commit with our eyes open.

It may be said, indeed, by those who hold a different opinion from myself, that the estimated extent of sale is too small, or that the members would willingly make a trifling addition to their annual subscription, for the sake of seeing their own communications in the form of regular *Transactions*. To these, however, I would reply, in the first place, that they must be very ignorant of the present sale of purely scientific works, who would bring forward this objection; and, secondly, that any permanent increase of the annual subscription would be, in fact, a direct violation of those terms upon which the members consented to join the Society. That such a proposition would, consequently, be resisted very extensively, cannot be doubted, and the very existence of the Society would be endangered. It will be observed, moreover, that in this estimate we go upon the supposition, that the members

^a At Mr. Swainson's request, we have entered minutely into the detail of the expenses, and find the statement above perfectly correct.—ED.

will consent to *pay* for their copies, and not expect to receive them, like those of the Royal, Linnæan, and other societies, as a return, *gratis*, for their annual subscriptions. We have put the question, in short, in as favourable a point of view as the advocates of an opposite plan can possibly expect; and yet, with all this, we find we should entail upon ourselves a burthen of about 97*l.* 10*s.* per annum *dead loss*, for that which can be accomplished without any expense.

With these facts before us, I cannot entertain the least doubt that the delegated authorities of our Society will studiously abstain from plunging us into all the expense and uncertainty of publishing *upon our own account*. In truth, we ought to be most thankful to any of those,—whose profession it really is, — who will take this risk and trouble upon themselves. We come, then, to inquire which of the existing periodical publications is most suited to our purpose. And here, the avowed declaration of the Editor, that the *Entomological Magazine* will be certainly continued, comes at a most appropriate time; for no other periodical is devoted to this science; and no other, in consequence, is more adapted to become the record of the Society's proceedings. It cannot be supposed, that the sale of this *Journal* would be *materially* increased by such an accession of new matter,—valuable and interesting as we may confidently anticipate it would be,—and therefore no very great favour would be bestowed upon the spirited individuals who are now supporting the *Magazine*, to their own pecuniary loss. Yet, on the other hand, we might hope that such a measure would, at all events, enable the work to pay its own expenses; and if, after a time, any amount of profit, worth naming, were to arise, I am disposed to think that the proprietors would gladly devote a portion of that profit towards the other objects, hereafter mentioned, which come within the range of the Society. On these, as well as several other minor topics connected therewith, I shall not, however, dilate. If the truth and justice of the main principles I am advocating be admitted, these subordinate details can be very easily arranged. To the Council of the Society should be conceded the right of selecting such papers as they deem most fit for *official* publication: while, if the authors of the “rejected” desire it, and the Editors of the *Magazine* can find room, the rest may still find their way to the public.

Thus new theories, and new views, will never be kept back from the light merely because they do not happen to please, or are in opposition to the opinions of the *Publishing Committee*.^b

But, if the Society are bent upon making to themselves a book, there is still a way of proceeding, which will at the same time accomplish *another* object, by which science can be effectually promoted. Let there be an annual prize awarded for the best essay on the natural arrangement of any one group of insects on sound philosophic principles; and let this essay, limited to a certain bulk, be then printed: the expense would be small; and the sale, throughout the entomological world, certain. The premium, or prize, should either be a sum of money, or a medal; in either case sufficiently valuable to make it worth contending for—not so large as to affect the funds of the Society. A thin pamphlet would contain the Essay of the year; and thus, in process of time, as “A Collection of Prize Entomological Essays,” the volume would indisputably become the most valuable collection of tracts on the science in our language.

^b The same principle of impartial justice which has induced me to speak in praise of the Zoological Society in the preceding pages, imperatively demands a public record of the following anecdote, the truth of which can be substantiated by documents. A few months ago a well-known conchologist (not a member of the Society) addressed to it, through the Secretary, a long paper on the natural arrangement of the primary tribes of the Mollusca or Testaceous animals, pointing out their circular affinities, and their analogous representations to other large groups in different tribes of the animal kingdom. This paper was sent to the present Secretary, who thought it prudent to submit it to the judgment of some of the Publishing Committee, before it should come in an official form to the Society. In this he was, doubtless, influenced by the considerate wish that the author should have the power of withdrawing it, in case these learned gentlemen were adverse to the publication of his paper. The result proved the knowledge which the Secretary had of the views and feelings of the Publishing Committee. The author was politely informed that they (the committee) could not sanction the publication of such a paper, wherein characters for classification were employed, quite at variance with all received authorities! The paper, of course, was withdrawn. What would have become of *science* if we had always acted upon this narrow-minded principle? An absurd theory will die in the birth; while, if there is any thing *good* in a tolerable one, there are those who can extract that good, and throw the refuse away. So much for the necessary evil of Publishing Committees! I hope this example will deter all who venture beyond the description of species, from sending papers to a *Publishing Society*, unless the council for the current year are composed of their personal friends. For myself, I never have, and never will, trouble such societies with communications that may become “Rejected Addresses.”

Next to the publication of original papers, and the patronage of the higher departments of the science, the *materials for study* deserve consideration; being, in fact, the means by which the former are produced. These branch off, as already intimated, into two divisions:—1. The collecting, or acquiring of new objects, for the purpose of forming a general entomological cabinet; and, 2. The formation of a library. To both of these the members and associates should have free access; and should enjoy the unrestrained use, so far as might be consistent with the preservation and care of the specimens, and the convenience of that amiable and promising entomologist, who has so liberally and zealously taken upon himself the office of our *Curator*.

It is quite unnecessary, in addressing naturalists, to expatiate upon the vital importance of a *cabinet of specimens*, whether as a source of instruction to the young beginner, of authority to the nomenclator, or as a “magazine” of research to the theorist. On all this there can be but one opinion.

The only difficulty we have to encounter lies in the means of accomplishing an object so important. Much may be expected from the future liberality of the members, because much has been already done,—more especially by our generous President,—towards laying a good foundation. We may advance, indeed, in this way, to a certain point; but beyond that, if we merely depend upon *presents*, our progress will be very small, and totally inadequate to the wants of the Society. It cannot be expected, that the gifts of the members should be extended beyond the *duplicates* of their respective cabinets; and these, where foreign insects are concerned, excepting in very few instances, will soon cease to increase the number of species in our public collection. It may not be expedient, perhaps, in the present infancy of the Society, to devise any plans for an extensive and constant acquisition of new species; and the length to which this paper has already extended forbids me from saying more upon this subject at present: it is one, however, in which we are, or can be, so much interested, that I propose resuming it in the next number of the Magazine. I may, however, suggest the expediency of allowing the Curator to expend, at his own discretion, any sum, not exceeding five pounds, in the acquisition of any lot of insects which circumstances may enable him to procure for the Society,

provided they may be so purchased considerably below the average or usual prices of such specimens. These will, of course, be exhibited to the Council, and to the Society at large, whose approval, or disapproval would be a sufficient guide to any future purchases of this description. Purchases, to a larger amount, may be decided by the Council for the time being.

(*To be continued.*)

ART. XVI.—*Entomological Notes.* By EDWARD NEWMAN, Esq., F.L.S.

(*Continued from Vol. I., page 514.*)

“*In his tam parvis, tamque fere nullis,*” &c.

CLASS.—COLEOPTERA.

NATURAL ORDER.—NITIDULITES, *ined.*

GENUS.—MELIGETHES. *Kirby.*

Mel. nigra. *Nigra, punctatissima; antennis pedibusque piceis.*

Black, thickly punctured; antennæ pitchy black, the basal and apical joints being lighter than the intermediate ones; the legs are pitchy black, the fore, lighter than the middle and hind legs; the prothorax and elytra are very deeply punctured, and covered with a short, grey villosity; the elytra are very narrow posteriorly. (Length $\frac{1}{2}$ lin.)

A single specimen of this insect is in the cabinet of Mr. Wailes.

GENUS.—CATHERETES. *Herbst.*

Cat. glabra. *Nigerrima, nitidissima; antennis pedibusque concoloribus.*

Very black and shining: antennæ black, the joints composing the club slightly downy; head, prothorax and elytra very black, shining, sparingly covered with a grey villosity; elytra short, and abruptly truncate; legs entirely black. (Length $\frac{2}{3}$ lin.)

Fig. 1.



Fig. 4. a.

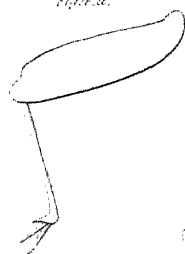


Fig. 5. a.



Fig. 2.

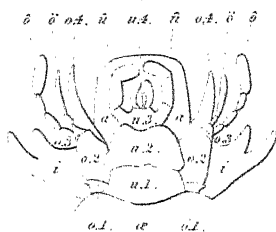


Fig. 3.

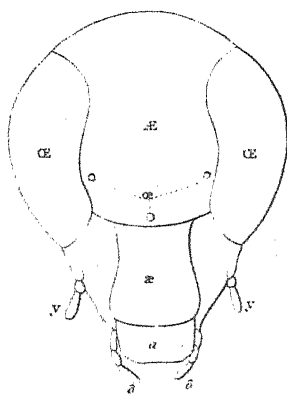


Fig. 6.

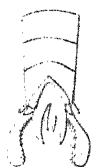


Fig. 7. a.



Taken in some abundance, by Mr. Davis, from nettles by the road side, between Ipswich and Woodbridge.

GENUS.—MICROPEPLUS. *Latreille*.

This genus is generally considered to be nearly allied to *Nitidula*, and if this is the case, it arranges properly with my MS. order, *Nitidulites*; I cannot, however, express myself confident on this point. No one can look for a moment on *Micropeplus*, without being struck with its resemblance to *Syntomium*, and other minute *Brachelytra*: in a natural arrangement, the union of the tribes of carnivorous and necrophagous beetles must take place by means of these or cognate genera.

Micro. obtusus. *Testaceus; capite anticè rotundato.*

Entirely pale brown; the head, instead of being pointed anteriorly, as in *M. Staphylinoides*, is obtuse and rounded.

The insects from which the above description was taken, are in the cabinet of Mr. Davis; they are less elongate, but rather broader than *M. Staphylinoides*; the lines on the elytra are rather more elevated than in that insect; they are perfectly formed, hard, and mature. Mr. Davis received them from Halifax.

NATURAL ORDER.—IPSITES? *ined.*

GENUS.—TRICHOPTERYX. *Kirby*.

Tric. Titan. *Nigra, pedibus albidis.*

Black, with very pale legs; head, above, and mouth black; throat pale testaceous; antennæ, with the incrassated basal joints, very pale, the following portion or shaft fuscous, the club rather paler, except the apical joint, which is dark brown, with the exception of the extreme point, which is paler: the prothorax and elytra are black, and extremely glabrous, reflecting, in some lights, a metallic hue; the under-surface of the prothorax and telum, together with the whole of the legs, including their coxæ and trochanters, are of a dirty white colour; the other portions of the insect, beneath, are nearly black. (Length $\frac{1}{8}$ lin.)

Mr. Davis has taken several specimens of this insect out of moss; it is less than half the size of the insect I possess, named *T. minuta* of Stephens, being about the magnitude of the dot of this i.

GENUS.—ATOMARIA. *Kirby.*

Atom. gutta. *Picea; elytris nigris, gutta media suturali sanguinea; pedibus ferrugineis.*

Pitchy black; antennæ ferruginous, with the basal half of the apical, and the whole of the following joints, fuscous: prothorax and elytra black; the latter with a distinct red spot, like a small drop of blood, on the centre of the suture, being half on each elytron; the legs are ferruginous. (Length $\frac{3}{4}$ lin.)

This remarkable insect is, I believe, unique in the cabinet of Mr. Davis; he found it in moss from Lincolnshire.

GENUS.—CRYPTOPHAGUS. *Herbst.*

Cryp. scutellatus. *Fuscus; metathoracis scutello nigro, elytris pedibusque testaceis.*

Head, prothorax, and under-side of the insect, dark brown; eyes and mesothoracic scutellum black; antennæ brown at the base, and testaceous at the apex; legs testaceous, with the exception of the femora, which are rather darker; elytra testaceous. (Length nearly 1 lin.)

This insect is, I believe, unique in the cabinet of Mr. Wailes, who kindly transmitted it for description, with others mentioned in this paper.

GENUS.—TETRATOMA. *Herbst.*

Tetra. picta. *Nigra; prothoracis marginibus, elytrorum maculis decem ferrugineis.*

Head, and exterior portion of the antennæ, fuscous; mouth, and basal portion of the antennæ, ferruginous; prothorax black, with all its margins ferruginous; elytra black, with ten ferruginous spots, one on each shoulder, one on the exterior margin of each elytron, one at the apex of the elytra and partly on each,

one on the centre of the sutural margin, also partly on each elytron; between this last and the humeral spots is one on the disk of each elytron, and, finally, between each exterior marginal spot and the apical one is another, on the disk of each elytron. Beneath, the insect is black, and very glossy, with the exception of the throat, which is pale: legs fusco-ferruginous, meso- and metafemora nearly black. (Length $1\frac{1}{4}$ lin.)

This insect is, I believe, also unique in the cabinet of Mr. Wailes: in beauty it exceeds any of the tribe I have ever seen. Mr. Wailes transmitted it to me with a MS. name, *decem maculata*, a name I have somewhat uncourtously superseded, although I must allow it to be exceedingly appropriate and descriptive; my only objection to it was its length.

GENUS.—RHYZOPHAGUS. *Herbst.*

Rhyz. collaris. *Ferrugineus, thorace fusco.*

Entirely ferruginous, with the exception of the prothorax, which is fuscous. (Length $1\frac{3}{4}$ lin.)

This species has been taken in considerable abundance by Dr. Howitt, and liberally distributed by that gentleman, with a MS. name, *R. cadaverinus* attached, a name which appears to me to convey rather an incorrect idea, Dr. Howitt having taken it from the *wood* of old coffins, and the genus being essentially wood feeders.

NATURAL ORDER.—BOSTRICITES, *ined.*

GENUS.—RHYZOPERTHA. *Stephens.*

Rhyz. cincta. *Nigra; prothoracis margine posteriori, elytrorumque disco testaceis.*

Head black; antennæ testaceous; prothorax black, with the posterior portion testaceous, giving the insect a belted appearance; elytra testaceous, with a wide exterior margin, black; legs testaceous. (Length $1\frac{1}{4}$ lin.)

This insect is, I believe, unique in the cabinet of Mr. Wailes.

CLASS.—ORTHOPTERA.

NATURAL ORDER.—LOCUSTITES, *ined.*GENUS.—RIPIPTERYX. *Newman.*

Caput cordatum, (Pl. VII., fig. 3.); oculis magnis ovatis (æ); ocellis tribus, (æ) lateralibus oculos, medio clypeum, fere attingentibus; clypeo subquadrato, elongato (æ); antennis 10-articulatis, prope os insertis (y). Os (fig. 2) partibus omnibus distinctis; labrum conspicuum, quadratum, (a) angulis rotundatis; labium divisiones quatuor perspicuè dispendens; insertione (u. 1) elevato, labii magnitudine; labio proprio (u. 2) lateribus, ante medium, productis, apice paullò angustiori, medio obsolete emarginato; palpigero (u. 3) minori, angustiori, labipalpos quasi tri-articulatos ferenti; ligula (u. 4.) in quatuor lobis palpiformibus quarum intermediis minutissimis, lateralibus manifestis, divisa; maxillæ validæ, lacinia (o. 4) elongata, acuta; galea (ö) palpiformi, quasi biarticulata, articulo (anne articulus?) basali minimo, apicali elongato; maxipalpis (ô) articulis quatuor, quorum apicali robustiori, omninò majori; mandibulæ validæ, (i) apice vix acutæ intus unidentatæ: lingua perspicua, linguiformis. Prothorax integer, supra obcordatus valdè convexus. Segmenta sequentia pariter patefacta. Telum (fig. 6) in laciniiis quatuor divisum, appendicibus sex armatum; laciniiis externis patefactis, internis minutis; appendicibus quatuor, externis minutissimis, duobus internis elongatis, obtusis. Proalæ brevissimæ, coriaceæ, contortæ. Met-alæ maximæ, longitudinaliter plicatæ, quasi flabellum, nervuris 38 longitudinalibus directis, unica transversa undulata, costa coriacea: metalæ pulcherrimæ, maximè mirandæ. Propedum (fig. 5.) femoribus, tibiisque simplicibus, tarsis quasi bi-articulatis, articulo primo angustissimo, brevissimo, subtus in lobum producto, secundo elongato, attenuato extus crassiori unguibus duobus armato. Mesopedes propedum characteres habent. Metapedum (fig. 4.) femoribus dilatatis, marginibus attenuatis, intus concavis, extus convexas, alas quiescentis aliquatenus recipientibus; tibiis rectis attenuatis, apice limbo producto acuto; tarsorum loco, duobus appendicibus rectis, acutis, suppleto.

At a future time I hope to offer some opinions as to the affinities of this extraordinary genus; at present I must leave the proficient in entomology to draw his own conclusions from the description and accompanying figures.

Ripip. marginatus. Niger; oculis prothoraceque albo marginatis.

Black; margins of the eyes and prothorax clearly and beautifully white; the antennæ on several of the intermediate segments have a white spot; the fore wings are tipped with white, the hind wings are transparent, with a tinge of rich brown, and slightly iridescent; the metafemora are margined superiorly with white; the other parts are entirely black. (Expansion of the wings, 1 inch; length of the body, 4 lin.) See Pl. VII. fig. 1.

The only specimen I have seen of this beautiful and singular insect, is in the collection of Mr. Hanson. He received it from Para, in South America. The Rev. F. W. Hope informs me he possesses a second specimen.

(*To be continued.*)

ART. XVII.—*Capture of Nocturnal Lepidoptera on Yew Trees in Norbury Park.* By JOHN WALTON, Esq.

SIR,—I herewith send you some memoranda of the habitats and times of appearance of a few nocturnal *Lepidoptera*, together with a short account of the method which I practised, very successfully, in capturing them. If you consider my observations of sufficient interest to merit a place in the Entomological Magazine, it will afford me great pleasure to communicate them through so excellent a work.

On Sunday evening, the 19th of September, 1831, my friends, Mr. Bowerbank and Mr. Hoyer, and myself, were accidentally walking near some ancient yew-trees, on an eastern declivity on the skirts of a large beech wood in Norbury Park, immediately adjoining the charming village of Mickleham, situated about half-way between Leatherhead and Dorking, Surrey. The buzz of moths attracted our attention; and observing them to settle on the yew-trees, it was suggested by Mr. Hoyer that they were probably feeding upon the berries, which were then ripe, and hanging in the most beautiful profusion. On the following evening we determined to investigate

this opinion, and prepared ourselves with such lanterns as we could procure; the result was the capture of several species in the very act of feasting on the saccharine juices of the fruit. Having previously arranged to leave Mickleham the day after, we regretted we could not then examine further, what appeared to us, a novelty to entomologists. On our return to London, we prepared ourselves with three bull's-eye lanterns, forceps, &c. and determined to visit the yew-trees. On the nights of the 24th, 26th, and 27th of September, we captured the following moths—all as perfect and beautiful as bred specimens—except *Orthosia lunosa*, which was faded, and evidently going off:—

	Specimens.		Specimens.
<i>Agrotis</i>		<i>Xylina</i>	
<i>suffusa</i>	2	<i>semibrunnea</i>	1
<i>nigricans</i>	1	<i>rhizolitha</i>	4
<i>Orthosia</i>		<i>Polia seladonia</i> . . .	plentiful
<i>litura</i>	sparing	<i>Xanthia</i>	
<i>Pistacina</i>	abundant	<i>flavago</i>	4
<i>lunosa</i>	2	<i>fulvago</i>	5
<i>macilentia</i>	abundant	<i>aurago</i>	6
<i>Glæa</i>		<i>citrago</i>	3
<i>spadicea</i>	1	<i>rufina</i>	2
<i>satellitica</i>	1	<i>Phlogophora</i>	
		<i>meticulosa</i> . . .	plentiful
		<i>Euthalia Psitticata</i> .	ditto

The following autumn (1832) I examined the same trees every other night, from the middle of September until the ninth of October, without seeing a single moth. The weather, about the latter end of September and the beginning of October, was cold, and very rainy, the wind high, and the yew-tree berries were not generally ripe, which indicated a late season. On the evening of the 10th the moths began to appear; and I continued my nocturnal visitations every night until the 16th, and afterwards three nights a-week, until the 5th of November. I captured the following seven species, which I had not seen the first year, and all the other species enumerated in the preceding list, except *Agrotis nigricans*, *Orthosia lunosa*, *Xylina semibrunnea*, *Xanthia flavago*, *X. fulvago*, *X. citrago*, and *X. rufina*.—

	Specimens.		Specimens.
<i>Orthosia</i>		<i>Oporabia dilutata</i> . .	plentiful
<i>Lota</i>	6	<i>Thera Juniperata</i> . .	1
<i>flavilinea</i> . . .	very abundant	<i>Sarrothrips</i>	
<i>Xylina petrificata</i> . . .	1	<i>degeneranus</i> . . .	sparing
<i>Miselia Oxyacanthæ</i> .	plentiful		

The result of this year disappointed my expectations. I had previously calculated upon a more bountiful harvest: however, sportsman-like, I attributed this to a bad breeding season,—to that mysterious Power which regulates and governs the number and irregular appearance of insects.

The long continuance of fine beautiful weather in the spring, summer, and autumn of 1833, induced me to expect a highly favourable season for autumnal moths, and for bringing the fruit of the yew-trees earlier to perfection. I determined once more to examine this interesting *habitat*, and commenced operations on the same night as in the preceding year (10th of October). I found abundance of moths enjoying, as usual, their favourite repast. The fruit was perfectly ripe, and the yew-trees beautifully adorned with fine large berries in the richest profusion; I lamented that I had not been enabled to arrive sooner, from an idea that several species of the early autumnal moths must have disappeared. I commenced by devoting, on an average, five hours every night for twenty-eight nights, from the 10th of October until the 14th of November. I was highly gratified, and amply repaid for my exertions, by the capture of upwards of two thousand moths. I *boxed*, on the average, eighty insects per night, of the following species:—

	Specimens.		Specimens.
Agrotis		Miselia Aprilina . . .	5
æqua	1	Polia seladonia . . .	plentiful
suffusa	plentiful	Xanthia	
Orthosia		aurago	ditto
litura	ditto	citrago	1
Pistacina	abundant	croceago	2
Lota	plentiful	rufina	2
flavilinea	very abundant	Phlogophora	
macilentia	abundant	meticulosa	abundant
Glæa			
rubiginea	5	Hybernia connectaria ♂	plentiful
satellitica	very abundant	Himera pennaria . . .	1
vaccinii	ditto	Euthalia	
spadicea	ditto	miata	3
subnigra	plentiful	Psittacata	plentiful
polita	abundant	Thera variata	3
Xylina		Oporabia dilutata . . .	plentiful
semibrunnea	3	Cheimatobia brumata . .	ditto
rhizolitha	plentiful	Margaritia ferrugalis . .	1
Calocampa exoleta	6	Sarrothrips degeneranus .	6
Miselia			
Oxyacanthæ	plentiful	Oncomera Podagraræ . .	2

I think it may be inferred, from my observations, that insects, generally speaking, are not much under the influence of a backward or forward season in their appearance, but have their regular periods of flight: the great and sudden changes of temperature, combined with the variable state of our atmosphere, perhaps, may have some influence in diminishing or increasing the number of insects. *Agrotis suffusa* appears at the latter end of September, and continues on the wing during the whole of October; but specimens taken towards the latter end of the month are a good deal faded; though plentiful this year, they were very scarce the two preceding years. This insect is stated to appear in June, and is supposed to be double-brooded. I only met with one, *Agrotis æqua*, a beautiful female, on the 10th of November, 1833.

I have no doubt that *Orthosia litura*, *Pistacina*, and *macilenta*, usually begin to appear at the latter end of September,—as my specimens, captured on the 24th, 26th, and 27th of September, 1831, were all as fine as bred specimens; whereas, on the 10th of October, in the two following years, the said insects were more or less faded, and evidently going off. They continue on the wing several weeks. *O. Pistacina* is truly denominated a protean species. Out of an immense number, I picked many very singular and astonishing varieties.

Orthosia lunosa, *Agrotis nigricans*, *Xanthia flavago*, *X. fulvago*, *citrago*, and *rufina*, also appear at the latter end of September, except the first, which appears earlier. They seem to have a much shorter existence; for I never met with them in October, except the two latter, which were difficult to recognize, they were in such a wretched plight.

Orthosia Lota, and *O. flavilinea*, I think I may confidently state, appear about the 10th of October, independent of the variable state of the season, having captured many of the former, and several hundreds of the latter,—“unquestionably,” as Mr. Stephens observes, “a scarce insect near London;”—they continue, like their congeners, several weeks on the wing; but not one specimen in ten was worth setting of those which I captured towards the latter end of October and in November.

Glæa vaccinii, *G. spadicea*, *G. polita*, and *G. subnigra*, begin to appear at the latter end of September, and continue on the wing until the middle of November. I am inclined to think, from a careful examination and comparison of several

hundred specimens, that they all constitute but one variable species.

Glæa satellitia I captured in very great abundance on the evening of the 11th of November. It is a most hardy moth, as it was out in all weathers, cold or wet, even when the yew-trees were saturated with rain, and adorned most beautifully with globules of water. I left it still out, on the 14th of November.

Glæa rubiginea.—I was extremely fortunate in detecting the locality of this insect, as it is stated to be unknown. There were only two, reputed to be natives, one in the British Museum, and the other in the cabinet of Mr. Dale. I captured mine at intervals, from the 10th of October to the 6th of November, all equally perfect and beautiful.

Xylina semibrunnea has not been taken of late years, and specimens are only to be seen in old cabinets. From my captures, it begins to appear at the latter end of September, and continues at intervals until the latter end of October. The three specimens captured from the 10th of October, 1833, to the 25th of October, were all very fine ones.

Xylina petrificata.—Of this insect, I took one specimen, on the 21st of October, 1832, equally as good as several bred specimens now in the cabinet of Captain Blomer. I think it is certainly distinct from the *X. semibrunnea*, though it appears about the same time, and in the same habitat. Mr. Stephens gives the time of its appearance in June; it may be double-brooded.

Calocampa exoleta.—The six specimens of this insect I captured between the middle of October and the 10th of November, all equally fine and beautiful. An entomologist will not require spectacles to see them on the yew-trees.

Xanthia croceago.—The last of two beautiful specimens was captured on the 31st of October; the other, about the middle of the same month. Mr. Stephens states that this insect appears in September.

Xylina rhizolitha appears at the latter end of September, and continues until the beginning of November. I captured a very fine specimen on the 5th of November.

Xanthia aurago.—I found them in great perfection at the latter end of September; and I continued to capture them now

and then during the month of October, but the specimens were somewhat faded.

Euthalia miata,—middle of October.

Euthalia Psitticata begins to appear at the latter end of September, and continues on the wing until the middle of November; but is very susceptible of cold, particularly the female; and only appears in warm humid evenings. The males were all, more or less, faded; but the females invariably, to the 14th of November, retained their beautiful rich green appearance.

Hybernia connectaria,—beginning of November.

Himera pennaria,—20th of October.

Thera variata,—middle of October.

Juniperata,—one taken on the 22d of October, 1832, somewhat faded.

Oporabia dilutata,—latter end of October.

Cheimatobia brumata,—middle of November.

Margaritia ferrugalis.—I captured one beautiful specimen of this rare insect at the latter end of October.

Sarothrips degeneranus,—appears in the middle of October, and continues until the beginning of November.

Oncomera podagrariæ,—latter end of October. I captured this Coleopterous insect feeding upon the yew-berries.

I have been induced to make the above observations upon the appearance of the autumnal moths, as some are not recorded, and others very incorrectly. I thought they might be useful to help to define the natural times of their appearance in the *imago* state. I think I may say, that very few persons have been out so many successive days and weeks for two years, or have captured so many insects as myself, at such an inclement period. I never lost a night; and was more generally successful in capturing the rarer species when the nights were warm and rainy.

I will now describe, in as few words as possible, consistent with clearness, the method of capturing the moths. I use a bull's-eye lantern, with a powerful lens,—the larger the better; a pair of forceps, such as are generally used by entomologists, having the sides and bottom covered with white gauze, and about six inches wide at the mouth when opened. Also I use a portable sliding rod, or one with two lengths, jointed like a fishing-rod,

from six to nine feet long, and a small round net, made of white gauze or muslin, screwed or fixed on at the end, of about five to six inches diameter, and the same in depth. I then direct the rays of light upon the insect. If it is within reach I use the forceps, and take it very deliberately; if out of reach, but within the length of the rod, they are easily jarred into the small bag at the end of your rod, lowered down, and transferred into the forceps. In this way they are captured with certainty, and the most surprising facility, principally in consequence of that singular instinctive faculty which many insects possess, in a greater or less degree, of feigning death when alarmed. For example, *Orthosia Pistacina*, and *O. litura*, contract their legs and wings, and fall into the bag-net, or forceps, immediately when touched, tumbling and rolling about without evincing the least signs of life; and so do many others. On the contrary, *O. macilenta* and *O. flavilinea*, and others, under the same circumstances, exhibit very little, if any, of that predisposition of feigning death. They will try to creep away when disturbed, having no inclination to use their wings, but are easily jarred off the berries or leaves into the bag-net, or induced to creep upon some part of it, until they are finally secured with the forceps. If they happen to miss the net in the act of falling, they invariably drop lightly to the ground, and may be taken from the grass with the forceps. The above observations only apply to the *Noctuidæ*, which carry their wings horizontally; the *Geometridæ*, which carry their wings erect, invariably fly away when touched or disturbed. It requires a little patience and address, when beyond the reach of the forceps, to secure any of this family; however, they affect death in some degree, and will fall a short distance as if shot, when the rays of light are directed upon them, and the small bag-net held just under them. It is necessary to wait patiently a few seconds, and gently to touch the twig with the ring of your net, until they feel inclined to exercise that shamming propensity; it must then be lowered with care, otherwise, if alarmed or disturbed, the insect will fly out of the bag before you can place over the top the flat side of your forceps. Take the bag-net to some convenient place, and the insect will be seen adhering to the bottom or sides with its wings erect. Then place the mouth of the forceps in a vertical position over the circle of the bag-

net, and lower it to the ground. This operation will raise up the bottom of the net, and with it the insect, which will fly up into the forceps, and these being closed at the sides, as before directed, it cannot escape. The yew-tree seems to flourish best in chalky districts. Few persons are aware of the great age and gigantic size of many of these magnificent trees in Norbury Park. They seem common in the woods and hedge-rows on the chalk in Kent and Surrey. Those in Norbury Park are really a natural curiosity. I invite entomologists to examine them, more particularly, of course, when the fruit is ripe. I am convinced that they will be rewarded by new discoveries. Norbury Park is within the limits of the metropolitan district, as circumscribed by Mr. Stephens. I hope the London entomologists will be excited, by my success, to continue the investigation of this interesting *habitat*: I fear I shall never have another opportunity.

I am, Sir, yours, &c.

JOHN WALTON.

14, Canonbury Square,
February, 1834.

ART. XVIII.—*On Leucospis; a Genus of Hymenopterous Insects.* By J. O. WESTWOOD, F.L.S., &c.

As a supplement to Mr. Walker's detailed descriptions of the previously recorded species of the genus *Leucospis*, I beg leave to offer to the entomological student the following descriptions of new, and notes upon several of the old species, preceded by a few observations upon the genus in question.

As a genus, *Leucospis*^a is especially interesting; firstly, from the circumstance that it comprises the largest known species of one of the most extensive families of insects—the *Chalcididæ*; secondly, from the extraordinary position of the *ovipositor*, which, when at rest, is laid along the back of the *abdomen*. It is difficult, at first sight, to imagine how this instrument

^a I have not adopted Dumeril's derivation of this word, as the insects exhibit no character in conformity with it.

can be brought into action; when, however, we consider the extreme flexibility with which this organ in other insects is endowed, by means of the muscles attached to its base, the difficulty soon vanishes. A remarkable instance of this capability, of which I have often been witness, is recorded by Mr. Haliday, in the 98th page of the second volume of this Magazine, (No. VI.) From this account, it will moreover be seen, that the abdominal segments themselves are capable of great elongation, by means of the connecting membrane; and Jurine, who appears to have observed the motions of *Leucospis*, states, that "leur ventre jouit, dans l'articulation du premier et du second segment d'un mouvement particulier de flexion menu de demirotation." It is, moreover, remarkable, that in the largest individuals belonging to another extensive family—the *Cynipidæ*, the females (genus *Ibalia*) carry the *ovipositor* in a similar situation,—these two genera being the only instances of so singular a peculiarity, throughout the vast order of Hymenoptera. A still further peculiarity exists also in these two genera, which has hitherto been unnoticed (at least in *Leucospis*) by entomologists; namely, the existence of a minute spiracle at the base of the fifth segment of the *abdomen*, in the females, on each side. Mr. Curtis is the only author who has noticed it in both sexes of *Ibalia*. (British Ent. Pl. 22.)

The wasp-like appearance of this genus, its *folded wings*, and elongated, cordate lower lip, establish a connexion with the *Vespidæ*, which, however, may not perhaps be deemed of a higher rank than one of mere analogical resemblance.

The character derived from the femoral teeth, as will be seen from my subsequent descriptions, can scarcely be considered sufficiently precise for the establishment of sectional divisions in the genus.

Leucospis gigas. Klug. Walk.

Varietate *feminæ* a celeberrimo Latreille accepi, e typo specifico, (ut auctoribus predictis descripto) diversam, 1^{mo}. maculis faciei flavis per marginem totum canaliculæ frontalis, utrinque currentibus usque ad antennarum insertionem;^b — 2^{do}. femoribus posticis internè piceo-nigris, apice flavis, externè flavis macula

^b It will be seen from Klug's character of *L. grandis*, that in this respect this variety approaches that species.

unica magna subquadrata infera nigra : oviductus abdominis segmenti 1^{mi}. medium attingens. (Long. corp. $6\frac{2}{5}$ lin.)

Coquebert's figure of the femoral spot, exhibits its precise form as in my insect.

It appears to me, from the Fabrician character of *L. gigas*, "*aculeo longitudine abdominis*," that Klug has misapplied the specific name; that his *L. grandis*, "*aculeo abdominis longitudine*," is the Fabrician *L. gigas*, and that consequently a different name ought to be given to his *L. gigas*.

Leucospis. Shuckardi. Mas. Nigra, collari bifasciato, scuto mesothoracico in medio maculis 2 oblongis, oviductu abdominis basin non attingente, femoribus posticis 6-dentatis. (Long. corp. $5\frac{3}{4}$ lin.; expans. alar. $9\frac{1}{2}$ lin.)

L. gigantem coloribus mentiens, sed magnitudine minori, statura graciliori notisque aliis distincta: caput nigrum maculis 2 rotundatis inter oculos, et partem superiorem canaliculæ frontalis flavis: mandibulæ basi rufescentes: antennæ nigræ, articulo 1^{mo}. (nisi ad basin) fulvo, 2^{do}. nigro, 3^{tio}. et sequenti, etiam extremo apice rufescentibus: collare flavo-bifasciatum, fasciâ anticâ ad angulos anticos paullò dilatatâ; mesothoracis scutum in medio, maculis 2 parvis oblongis, et ad latera utrinque vitta subcuneiformi flavis; mesothoracis scutellum lunula lata flava; metathoracis præscutum^c dentibus 2 parvis munitum: epimera metathoracica fere tota flava: abdomen thorace paullò longius, segmento 1^{mo}. fascia lata, 2^{do}. fascia angusta, 3^{tio}. fascia subangusta flavis, omnibus in medio interruptis duabusque anticis ad latera abbreviatis, denique lunulis 2 (fascia 3^{tia}. multo minoribus) apicalibus flavis: oviductus niger, abdominis segmenti 1^{mi}. medium attingens: coxæ anticæ et intermediæ nigræ, posticæ nigræ, angulo supero apiceque subtus (at leviter) flavo notatis: pedes 4 antici fulvo-flavi, femoribus basi obscurioribus; femoribus posticis internè piceo-nigris, apice fulvis, externè flavis, macula magna rotundata infera nigra, dentibus 6 nigris munitis, 1^{mo}. brevi acuto, 2^{do}. omnium longissimo acuto, reliquis longitudine decrescentibus obtusis; tibiis et tarsis posticis fulvis, illis linea interna nigra: alæ fuscæ, costa saturatiori.

I am indebted to W. H. Shuckard, Esq., a gentleman who has devoted much attention to the study of the

^c According to the nomenclature of the thoracic segments of Mr. MacLeay, it is the metathoracic præscutum, (post dorsolum, *K. & S.* or metathoracic scutum, *And.*) which is toothed.

Hymenoptera, for my example of this species, which I have inscribed with his name. He believes it to be of American origin, as it came into his possession in company with various insects from that country, including *Pelecinus polycerator*, &c. It ought to form a distinct section in the genus, from the posterior *femora* having only six teeth, although, in certain positions, a minute rudiment of a seventh tooth is just visible.

Leucospis subnotata. Fem. *Nigra, colore albido-flavescenti parce notata, femoribus posticis 9-dentatis, coxis posticis immaculatis oviductu abdominis basin superante.* (Long. corp. $4\frac{1}{4}$ lin.; expans. alar. 8 lin.)

Caput nigrum, punctatum, immaculatum, canaliculâ frontali sub-metallicâ: antennæ nigræ articulo 1^{mo}. subtus albido, 2^{di}. apice, 3, 4, et ultimo obscure rufescentibus: thorax niger, punctatus; collaris lateribus margineque postico toto, et antico abbreviato tenuiter flavidis; mesothoracis scutum lateribus flavido tenuiter vittatis, dorso immaculato; mesothoracis scutellum apice lunula angusta albida; metathoracis præsentum inerme; epimera metathoracica lineâ flavida notata: abdomen nigrum, punctatum, basi obscure rufescens, segmento 1^{mo}. versus apicem flavido—(latè et in medio interruptè)—fasciato, segmento 2^{do}. sequentibus multò angustiori ad latera linea tenui albida inferè notato, 3^{ti}. apice flavido fasciato, (in medio supra angustiori et interrupto) lunulisque duabus minoribus apicalibus flavidis, oviductus piceus, abdominis basin superans: coxæ omnes nigræ, posticæ 2 apice rufescentes, internè albido vix notatæ, femora 4 antica nigra, apice, albida; tibiæ anticæ nigræ lineâ superâ fulvâ, intermediæ et posticæ flavida lineâ inferâ nigrâ, femora postica nigra, apice internè fulva, externè basi et apice maculâ parvâ albidâ notata, dentibus 9 brevibus nigris, 1^{mo}. crassiori obtuso, 2^{do}. parvo; reliquorum 4 et 5 longioribus acutis; tarsi omnes fulvi: alæ fuscæ, costa saturatiori.

Habitat in America Septentrionali, apud Halifax, Novæ Scotiæ; ubi rarè occurrit. Communicavit Dom. G. B. Sowerby.

I will only add, that in a genus like the present, in which the specific characters depend upon apparently trifling distinctions, it is almost an useless waste of labour to attempt to identify the species so concisely described by the old authors.

Leucospis Hopei. Mas. *Nigra, collari unifasciato, epimeris metathoracicis nigris, antennarum apice tibiis tarsisque rufis.* (Long. corp. 5 lin.; expans. alar. $8\frac{1}{2}$ lin.)

Caput nigrum, immaculatum: antennæ rufæ, articulis 2 basalibus nigris: thorax niger, collare nigrum, margine postico flavo; mesothoracis præscutum lunulâ tenui flava; epimera metathoracica tota nigra: abdomen breve, convexum, flavo tenuè 3-fasciatum, fasciis 2, primis ad latera abbreviatis, 1^{ma}. lunulata, coxæ posticæ flavo-vittatæ: pedes nigri, femoribus apice, tibiis tarsisque rufis, femoribus posticis (uno) 10-, (altero) 11-denticulatis: alæ subfuscæ, costa saturatori.

Habitat in America Meridionali, apud Valparaiso. In Mus. Dom Hope, F.L.S. Z.S. E.S. &c.

Named in honour of the gentleman in whose extensive collection it is uniquely contained.

Leucospis Spinolæ. *Nigra, margine omni collaris (vel antice abbreviato in ♂) flavo, coxis posticis flavo latè fasciatis, tibiis anticis extus nigrescentibus, intermediis flavis, scuto mesothoracico ♀ ad latera flavo-lineato.*

Leucospis *intermedia*. Spinola. *Ins. Lig.* Fasc. 4. p. 236, No. 283. (Nec. Fonscolombii, *Ann. Sc. Nat.* 26. 274.)—(Long. corp. $3\frac{1}{4}$ lin. ♂; ♀ $4\frac{1}{2}$.)

Habitat in Liguriâ.

On comparing Spinola's detailed description of the species which he named *intermedia*, (and of which he had captured many specimens), with Mr. Walker's description of *L. dorsigera*, with which the latter has united it, sufficient differences^d will be found to warrant their separation; and the name *L. intermedia* having been previously employed, I have named it in honour of the celebrated Italian Hymenopterist, by whom it was first described. M. Fonscolombe's description of the species which he named *L. intermedia*, and which is taken from a ♀ specimen, agrees with Mr. Walker's description of *L. dorsigera* ♀; but not with Spinola's *L. intermedia*, as used by Mr. Walker without any expression of doubt; although M. Fonscolombe gives the reference to Spinola with a query, and points out the differences between his own and Spinola's insect.

^d The different colour of the basal joint of the male antennæ, the interrupted anterior yellow margin of the collar in both sexes, the want of the lateral lines at the base of the wings in the female, and the want of the broad fascia on the coxæ of *L. dorsigera*, are especially observable.

From Spinola's observations, the economy of this insect appears to be very different from that of the other species which have been observed. "*Fæminam* inveni in gallâ fungosâ coronatâ mespiliformi *Quercus ramulorum*, in montibus *Orearii*."

Leucospis assimilis. *Westw.* ♀ (nova species.) *Nigra, abdomine thorace dimidio fere longiore, collare flavo-marginato, margine antico abbreviato, scuto mesothoracico toto nigro, abdomine utrinque macula minuta flava inter fascias 1 et 2, tibiis intermediis flavis.* (Long. corp. $3\frac{3}{4}$ —4 lin.; expans. alar. $6\frac{3}{4}$ — $7\frac{1}{4}$ lin.)

Leuc. dorsigeræ affinis. Corpus gracile: caput nigrum, immaculatum: antennæ nigræ, articulo 1^{mo}. in medio subtus flavescenti: collare nigrum, bifasciatum, fascia antica abbreviata, postica elongata, et per margines laterales collares paullò producta?: mesothoracis scutum totum immaculatum, ejusdem scutellum apice lineâ transversâ, integrâ, antice ferè rectâ: metathoracis præscutum obtusè bidentatum: epimera metathoracica flavo-notata: abdomen thorace dimidio ferè longius, subcompressum, ad secundum segmentum angustius, flavo 3-fasciatum (fasciis in medio supra interruptis) 1^{ma}. utrinque abbreviata, inter fascias 1 et 2 utrinque macula minuta flava; fasciis 2 et 3 longitudine æqualibus: oviductus ad basin abdominis productus: coxæ 4 anticæ nigræ, femora 4 antica nigra apice pallida tibiæ anticæ flavescentes extus nigrescentes, tibiæ intermediæ flavæ: coxæ posticæ nigræ, apice subtus macula minuta flava notatæ; femora postica interne nigra, externe nigra, basi subtus margineque apicali supra flavis; dentibus 12-armata, 1^{mo}. maximo, e dentibus reliquis in femore uno dentes 3 et 4, in altero dentes 5 et 6 sunt majores; tibiæ posticæ flavæ, intus nigræ; tarsi omnes flavidì: alæ subfuscæ, costa saturatiori.

Var. ♀.—Articulo 1^{mo}. antennarum subtus flavido vix notato, collaris lateribus totis flavo tenuè marginatis, coloreque flavo femorum posticorum minus extenso, femoribus dentibus 16-armatis (dentes 2 et 4 in uno femore fere oblitterati), 1^{mo}. maximo, 6, 7 et 8 reliquis majoribus: cæteris cum præcedenti ad punctum convenit.

Habitat in Europa—Germania? In Mus. Hope.

The remarkable difference in the denticulation of the posterior *femora*, in this species, is worthy of observation.

I think it not improbable, that the insect described by Mr. Walker as a doubtful variety of the male of *L. dorsigera* (*Ent. Mag.* Vol. II. p. 20) is the male of the above described species, regard being had to the circumstance, that in the species allied to *L. dorsigera* the females are distinguished by a greater share of yellow colour than the opposite sex.

Leucospis Sicelis. Westw. ♀ (nova species.) *Abdomine thorace dimidio longiori, collari flavo lineâ tenui centrali transversa nigra, tibiis 4 anticis totis flavis, coxis posticis apice subtus flavo-notatis, femoribusque posticis 15-dentatis.* (Long. corp. $4\frac{3}{4}$ lin.; expans. alar. 8. lin.)

Corpus satis crassum, *L. intermediæ* (Spinola), et *dorsigeræ* affinis, e quibus colore pedum, &c. magnitudineque majori crassiori differt: caput latum, versus os vix attenuatum, nigrum, immaculatum: antennæ nigræ, articulo 1^{mo}. flavo: collare flavum, fascia transversa centrali tenui nigra; mesothoracis scutum in medio immaculatum, ad latera lineolis 2 flavis obliquis prope alarum basin; mesothoracis scutellum apice linea transversa integra flava; metathoracis præscutum fere inerme; epimera metathoracica flavo notata: abdomen thorace dimidio fere longius, flavo latè 3-fasciatum, fasciis in medio interruptis, fasciis 1 et 2 latitudine æqualibus, illa ad latera abbreviata, hac late fere ad originem oviductus lateraliter producta, inter 1 et 2 utrinque macula lateralis minuta elongata (quasi rudimentum fasciæ 2^{dæ}. oblitteratæ), fascia apicalis magnitudine mediocri: oviductus ad basin abdominis productus: pedes flavi, coxis anticis femorumque anticorum et intermediorum basi nigris: coxæ intermediæ nigræ, macula minuta flava: tibiæ 4 anticæ totæ flavæ immaculatæ: coxæ posticæ nigræ, apice subtus macula parva flava; femora postica internè nigra, apice fulva; externè flava, macula elongata infera apicali nigra; dentes 15 nigri, 1^{us}. magnus, cæteri parvi; tibiæ posticæ latere interno nigræ: alæ fulvescentes, costa saturatiori.

Habitat in Sicilia. In Mus. nostr. a celeberr. Haworth, preceptore nostro Entomologo, heu valde deflendo! communicata.

Note.—*L. petiolata* and *atra* (Fab.) appear to belong to a subgenus distinct from the preceding.

ART. XIX.—*Notes on the Bethyli and on Dryinus pedestris.*
By A. H. HALIDAY, Esq. M.A.

1. *Bethylus*.—The insects of this genus seem fond of the flowers of *Syngenesia*, but their principal haunts are in dry sandy districts near the sea. The low tufts of *Rosa spinosissima*, flourishing among the sand-cliffs, support numerous larvæ of *Tineidæ*, which when full fed, often fall into the little pits of loose sand formed at the foot of the cliffs, by the gradual scaling of the bank and the eddies of wind. These pits are complete traps for various insects, to which *Myrmica rubra* and other predaceous species resort, and among these our *Bethyli* will be seen prowling. On the fifth of last June, I observed a female of the largest size occupied with one of those larvæ which was full fed, and, I should think, about six times its own weight. It had seized this by the mouth, and was with great perseverance endeavouring to transport it up the sliding sides of the pit. Perceiving that though apparently not discouraged after ten minutes' ineffectual exertion, it had no chance of succeeding, and wishing to trace its proceedings, I placed a fragment of straw in the hollow within its reach. The moment it had touched this railway the state of affairs was changed—taking a firm hold with its hind feet, it swung its prey round, and set off with it at a smart pace, walking backwards and dragging the body after it. From this time it was constantly endeavouring to ascend the face of the sand cliff, availing itself with admirable adroitness of the morsels of grass, twigs, &c., imbedded in it, not seeming to care how obliquely they lay, if they enabled it to gain a little elevation; so that its track was a zigzag. Frequently it chose stems which, rising nearly erect, receded from the bank above: I at first thought it was losing its labour, but it was at no loss how to act: after ascending a few inches with the whole weight suspended in the air from its mandibles, it would poise itself and its burden across the stem, with its head towards the bank, then throw itself off, at the same time extending its wings, which, though incapable of raising it from the ground, were able to give it some impulse towards the bank, on which

it thus alighted, at a spot someway above the springing of the stem. If, on ascending one of these twigs, it discovered that it was bent the wrong way, or receded too far from the cliff, it lost no time in hesitation, but stopping short of a sudden, commenced the descent again. It may be guessed that, dragging a gross, slimy body over twigs, &c., close to or half buried in the sand, frequent impediments would occur, which its extreme activity in walking indifferently, sideways or backwards, and main exertion of muscular force, generally enabled it to overcome; but sometimes it had drawn its burden under or between two twigs, which arrested its course: after a violent tug or two without effect, it would retrace its steps, dragging the *larva* in the opposite direction, till it was extricated, then disposing it so as to keep clear of the obstacles, start again. On every occasion when it had left its hold, it made for the same part, and spent some time in fastening its mandibles on the mouth of its prey beneath, so that the *larva* should be dragged on its back: once where this was not the case, it was impeded by the latter grappling with its feet the twigs over which it was drawn, and its captor quickly finding the error, let go and took a new hold in the usual position. When it had ascended about two feet, it came upon a fragment of reed partly imbedded in the sand, the stem of which was broken off and open below, a few dry elastic shreds of the leaf only remaining. Having reached the part where these grew, it by a strong pull drew its burden about half through, till its body was grasped between two of these as in a vice; then letting go, it began to explore the bank on each side to some distance, tapping with its antennæ the conspicuous objects: in a few minutes seeming to be satisfied, it hastily descended the reed, and entered its stem at the lower end; it did not remain long in the interior, and on its reappearance, set off for the spot where it had left the *larva*, which, after pulling it out of the holdfast, it seized by the mouth as usual, and began to descend the reed again; it did not complete the journey this time, but taking advantage of the same kind of security to detain its prey, it repeated the *reconnaissance*, then returning, dragged it to the opening, and leaving it there, plunged in itself, but immediately reappearing, drew in the *larva* head foremost, speedily

disappearing in the interior; so that I could not observe its subsequent proceedings, and being obliged to turn homewards, I left them undisturbed. I think, however, it will seem probable that the bore of the reed was employed instead of an artificial funnel, for the cells which should contain the progeny of the *Bethylus*, with its store of provision. If these insects select only full grown caterpillars, I can scarcely imagine one of the smaller individuals^a managing these unwieldy bodies.

2. *Dryinus pedestris*.—The first time I met with this species, it was in company with some *Myrmicæ*, (not *M. rubra*) under a stone, in a chalky lane, near Darentwood. In this island, its haunts are on the sand-hills of the coast, among which *Formica emarginata* swarms. The *Dryinus*, which is not dissimilar in form and colour, moves among them distinguished by its hitching gait, produced by the enormous length of the coxæ and trochanteres of its fore legs; it can run pretty fast, however. What is the nature of its society with the ants? I witnessed an occurrence which shews that it is not always quite amicable. Four ants were bearing off one of the *Dryini* quite alive and vigorous, though not able to struggle much in their gripe; my approach disturbing them, three scampered off, but the fourth, more determined, held on; the *Dryinus*, however, as soon as she got fair play, shewed fight, and though her small jaws seem ill calculated to match those of an ant, the battle was maintained without any visible advantage, the combatants rolling and tumbling over in the most approved Kentucky fashion. I have not yet detected the male of this insect, having only been able to visit the spot where it occurs, one morning this summer, and that a very unfavourable day, so that I still hope by a future search to obtain it.

A. H. HALIDAY.

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^a The *Bethylæ* vary exceedingly in size, the smaller individuals have the head narrower, and the wings usually very imperfect (*B. Syngenesiæ*, n.); but the varieties are so indefinite, that I am disposed to refer them all to one species, *B. punctatus*, Latr.

ART. XX.—*Notice of Entomological Works.*

1. *British Entomology; by John Curtis, F.L.S., &c.*—Nos. 121, 122.—Pl. 482. *Smerinthus ocellatus*, (Lepidoptera Sphingidæ); 483. *Mordella abdominalis*, (Coleoptera Mordellidæ); 484. *Baëtis dispar*, (Neuroptera Ephemeridæ). This figure is too highly coloured. Pl. 485. *Cordylura livens*, (Diptera Muscidæ); 486. *Macrocnema unimaculata*, (Coleoptera Chrysomelidæ). This is certainly not a species; every individual of *M. Hyoscyami* has a light mark, more or less distinct, on the metafemora. Pl. 487. *Cochleophasia tessellea*, (Lepidoptera Tineidæ); 488. *Limnephilus elegans*, (Trichoptera Phryganidæ). *Opetia lonchopteroides*, (Diptera Empidæ). Mr. Curtis has placed it with the *Dolichopidæ*.

2. *Magazine of Natural History.* Nos. 37, 38.—We believe our good nature tints every thing *couleur de rose*. No. 37 of this Magazine appears to us the best number but one, and that one is No. 38. Mr. Loudon praises us, and we praise in return, some of our readers may observe; but we have a better motive,—we praise, because praise is due.

3. *Entomologia Ediniensis; by James Wilson, F.R.S.E., and Rev. James Duncan.*—This work has long been talked of, and we anticipated its appearance with some eagerness; it was to be “A Description and History of the Insects found in the neighbourhood of Edinburgh.” We opened it, and lo! instead of Edinburgh insects, we find none but the commonest London ones; scarcely a dozen that we have not taken in the well-besmoked cabbage gardens of Battersea; scarcely a dozen that Mr. Stephens has not already described as insects of the metropolitan district. There is, indeed, some interesting matter from Kirby and Spence, &c., here and there interwoven; and the descriptions of genera are sufficiently accurate.

4. *The London and Edinburgh Philosophical Magazine, and Journal of Science. Third Series. Vol. IV. Nos. 20, 21.*

(1.) *On the Zimb of Bruce, as connected with the Hieroglyphics of Egypt; by the Marquis di Spineto.*—Much has been published, but little is known of the *Zimb* or *Tsaltsalya*, which is said to spread terror and death among men and beasts, wherever it is found. Its habitation is confined to the “black fat earth,” a soil in the marshy parts of the Nile. Latreille supposed it to be a *Tabanus*, but this can hardly be, if the account of its ravages is correct. Other authors have supposed it to be an *Æstrus*, but the form of its mouth seems very different. The Marquis observes, that it is figured on the Egyptian antiquities, and comments on the derivation of its name. He hopes to obtain specimens, therefore we expect that the nature of the insect will be soon satisfactorily ascertained.

(2.) *Descriptions of some hitherto Nondescript British Species of May-flies of Anglers; by John Curtis, Esq., F.L.S., &c.*—This paper comprises descriptions, in English, of several genera and species of the *Trichoptera* and the *Ephemeridæ*. The characters are short, and not very clear. The new genera established are *Brachycercus*, *Molanna*, *Mormonia*, *Brachycentrus*, *Thya*, *Glossosoma*, *Anticyra*, *Agapetus*, and *Agraylea*. Many of these are indicated in the second edition of Stephens’s Nomenclature of British Insects.

5. *Annales des Sciences Naturelles. Paris. Tome XXX.*—This volume contains several essays on Insects, among them,—1. “Observations on *Aphides*, by M. Dutrochet.” 2. “Description of some Dipterous Insects, observed in Spain, by M. Léon Dufour.”—Among these is *Myrmemorpha*, a new genus, of which he found one species, a very minute insect, with rudimentary wings. He considers it to be allied to *Scenopinus*, but its habits appear to be very different, and, as well as the form of its antennæ, agree better with those of *Borborus*, and of the *N. G. arenaria*, (Haliday). 3. “Abstract of some Observations on the Changes of Form, which the young *Crustacea* undergo, by M. Milne Edwards.” 4. “Abstract of a Monograph on the *Odyneri* of Belgium, by M. C. Wesmael.”

6. *Revue Entomologique, publiée par Gustave Silberman. Strasbourg. Livraisons 6 et 7.*—Among the contents are,—

1. "Observations on the Habits of several Mexican *Coleoptera*," communicated to the Editor by M. Chevrolat, who is publishing a work on Mexican Insects. 2. "Description, accompanied by a figure, of *Dadoychus flavocinctus*, (Coleoptera Cerambycidae) by M. Chevrolat."—This is an undescribed Insect, remarkable for its third and fourth abdominal segments, which are yellow, and apparently phosphorescent, a character not possessed by any other described *Cerambycidae*. 3. "On the Natural Division of Terrestrial *Hemiptera*, considered especially in relation to the Structure of their *Antennæ*, by Dr. H. Burmeister." Three new genera are established,—viz. *Pseudaradus*, *Merocoris* and *Asopus*. 4. "On the *Cicindelidæ*; with the Characters of two New Genera, (*Odontocheila*, and *Procephalus*), by M. F. de Laporte." 5. "Descriptions and Figures of two new Insects, (*Thorictus castaneus*, and *Chirodica chalcoptera*) by M. Germar."

7. *Magasin de Zoologie; par F. E. Guérin.*—The Entomological papers are,—1. "On the Genus *Leucothyreus*, and its Affinities, by J. O. Westwood, Esq., F.L.S., &c." 2. "Commencement of a Monograph on the *Pselaphidæ*, by M. C. Aubé," &c.

8. *Iconographie, &c., des Coléoptères d'Europe; par M. le Comte Dejean, et M. le Docteur J. A. Boisduval. Tome III., Livraison 8. Tome IV., Livraison 1.*—The genus *Amara* is concluded, and figures are given of the genera *Lophidius*, *Antarctia*, *Masoreus*, *Pelecium*, *Eripus*, *Cratocerus*, *Somoplatus*, *Daptus*, *Cyclosomus*, *Promecoderus*, *Axinotoma*, *Cratacanthus*, *Paramecus*, *Cratagnathus*, *Agnoderus*, *Acinopus*, *Barysomus*, *Amblygnathus*, *Platymetopus*, *Gynandropus*, and *Selenophorus*.

THE
ENTOMOLOGICAL MAGAZINE.

JULY, 1834.

ART. XXI.—*Essay on the Classification of Parasitic Hymenoptera, &c.* By A. H. HALIDAY, M.A.

(Continued from page 106.)

Of the Ichneumones of the Second Line, (Ichneumones adsciti, Essenbeck.)

THE species which have been referred to the genus *Aphidius* appear to compose a natural group, from the uniform way in which the characters, common to them all, correspond with the habits of those few whose history is known from actual observation. They are minute *Ichneumones*, each individual being nourished by a single puceron; the empty skin of this is substituted for a cocoon, the larva being provided with no secretion of silk, like the others of this family. Accordingly, we find it solitary, devouring all the interior of its victim, and attaining a proportionate bulk. The spherical figure of that case adapts itself to the inflected attitude of the full grown larva, and of the pupa developed from it.^a The same position finally is subservient to the functions of the fly, which is thus enabled to bring the borer under the direction of her sight; for, being equal or superior in size to the objects of her attack,

^a I presume that the pupæ of the Chrysidæ are similarly inflected. “J’ai vu le *Cleptes nitidule* allonger beaucoup son tuyau en passant auprès d’une larve de *Tenthrede*, et le pousser vivement contre elle. Quoiqu’il lui eût fallu pour cela recourber son abdomen et diriger ce tuyau entre ses pattes en avant de la tête, l’opération entière fut l’affaire d’une seconde.”—*Lé P. St. Fargeau*. Some of the petiolate *Pteromali* (*Miscogasteridæ*, Walker) also have the pupa bent double, though less completely; but these do not infect the abdomen in oviposition.

she can find no footing on them. As they are accessible, and not defended by hair or a tough coat, the borer itself is short and delicate. A summary of these particulars will afford the most comprehensive notion of the group.

An acquaintance, though imperfect, with the economy of the insects composing it, has afforded, in the relation which subsists between this and the form of the parts in the imago, some data for estimating the comparative importance of their several variations. In the general considerations we have, consequently, ventured to overlook distinctions such as elsewhere are of much significance, and to assemble species offering considerable diversity in the antennæ, wings, and feelers. Hence we may be prepared to find the influence of similar variations modified and subdued, to a certain extent, in contiguous groups; while, in pursuing the chain a little further, some or all of these organs may affect a determinate character, through a protracted series of affinities. In the present family, generally, the antennæ may be said to vary indefinitely with sex and species; and, where we detect the tendency to a typical number, there is room to suspect an approach to one or other of the remaining Parasitic families, which has (if I may express it so) communicated its character to such adjacent groups. These approaches are few and evanescent, and while they may serve to indicate the external relations of the family, do not seem applicable, in a primary degree, to the further subdivision of it. The cells of the wings, by their number, figure, and position, afford distinctions generally precise and easily apprehended, constant in the sexes, and whose variations may be referred to a limited number of types; but these are not so readily generalized, and, on account of the abrupt transitions between them, sometimes yield no clew to the connexion of the groups which they distinguish. At the same time they furnish most convenient characters for the separation of the minor groups; and, if carefully compared with the variations of other parts, will be often of the highest value as obvious indications of characters more influential, but also more difficult of investigation. The mouth, whose structure enters so largely into most systems, does not exhibit much variety of development among insects whose instruments of industry and weapons of defence are seated elsewhere, and which scarcely seem to require nourish-

ment in the perfect state. *Agathis* and *Alysia*, indeed, in their types, present remarkable modifications of the lips and jaws, but, after a few removes, these too subside into the prevailing monotony. Of all the parts of the mouth, the feelers seem to afford the most convenient means of methodical division; their differences, like most characters determined by number, being easily seized by the eye and expressed with certainty. Such a method comes recommended also by the weight of authority, almost every recent arrangement of the family resting principally on those organs. Analysis has shown their variations to be of minor consequence in determining relations between the subdivisions of *Aphidius*, while the separation of that genus has made their application to the rest more easy. The objections arising from the former consideration will be lessened if we regard these last as nearer in affinity to the genuine *Ichneumones*; for they, throughout their myriad species and multiplied gradations of form, adhere almost invariably to one number, the incipient tendency to change appearing only at one point.^b And, indeed, in the single genus we have been considering, their extremes of variation are more distant than in all the remainder of the *Adsciti*. The figure and proportion of the joints are more constant in the maxillary feelers than in the labial, where the diminution of the penultimate joint makes the precise number sometimes difficult to determine, so that we shall gain in convenience by omitting the consideration of the latter at this stage. Following, in other respects, the arrangement of Von Essenbeck, let us place first those which have maxillary palpi of five joints, composing the family named by him *Bracones*. With respect to the nomenclature, it may be remarked, that he at first applied the generic name of *Bassus* to *Cryptus manducator* of Panzer, and from that type derived the appellation of his second family; more recently *Bassus* has ranked among the genuine *Ichneumones*, being appropriated, by Gravenhorst, to a group represented by *Anomalon lætatorium* of Panzer; to this Von Essenbeck has conformed, substituting the Latreillian genus *Alysia* in its place, yet,

^b The genus *Porizon*, which betrays a departure from the type in other particulars; the predominant characters, however, are unchanged; and the subgenus *Odontomerus* may almost be described as a *Porizon* resuming in its mouth and lower wings the ordinary character of genuine *Ichneumones*.

either from inadvertence or on principle, he has retained his original but now ambiguous name for the family. It seems more correct to obviate this duplicity of terms by adopting, instead of it, *Alysiidæ*, as proposed by Mr. Stephens. I should be still better pleased to avoid giving any names to these sections; regarding their separation, for the present, simply as a convenient artifice, which may possibly interfere with the discernment of their true relations, as much as it facilitates their examination in detail.^c It is never too soon to retrace an erroneous course, and I have to regret having hastily applied new-coined names to tribes so called, and similar subdivisions of the family: renouncing such innovations as, at least, premature, and retaining the name *Ichneumonones*^d for the family at large, we may speak of these, as

Ichneumonones which have no exterior cell of the disk in the upper wings, and do not inflect the abdomen completely, whose pupa is enclosed in a cocoon spun by the larva, and is not bent double;

And first, of those with maxillary palpi of five joints;

Fam.—BRACONES, Ess. BRACONIDÆ, Stephens.

The native species, so far as they are known to me, may, I think, be all arranged by relation to the four genera, *Agathis*, *Microgaster*, *Bracon*, and *Leiophron*, as exemplified by *Agathis malvacearum*, Latreille; *Ichneumon globatus*, Linné; *Bracon denigrator*, Fabricius; and *Cryptus sticticus*, Fabricius.

Having assembled the species I possess according as the

^c For the general characters with which Von Essenbeck has sought to corroborate this division seem vague and uncertain; but, from a cause alluded to before, they were drawn from a comparison of genera in some degree fortuitously assembled, so that no better result could be expected. If the families were sufficiently distinguished by external appearance, it is not likely that they would have eluded the tact and judgment of this distinguished author, to which our present subject is scarcely less indebted than a sister science. The contents of each family being reduced to more strict conformity with the principles of his method, I cannot discover any auxiliary distinctive characters of general application.

^d Or rather *Ichneumonidæ*, as used by British authors, for the sake of general analogy and harmony of nomenclature.

resemblance of one or other of these predominates, I find the resulting groups may be separated in this manner:—

Second brachial cell of the lower wings bounded externally by	{	three angles	AGATHIS, &c.
		{	determinate and alike in the sexes MICROGASTER, &c.
			varying with sex and species; cubital cells of the upper wings {
			three . . BRACON, &c.
			two . . . LEIOPHRON, &c.

These characters have the appearance of being taken arbitrarily, the table being calculated simply to distinguish the groups, without exhibiting their relative position or connexion; and other schemes might be drawn up which would attain the same object, as, indeed, any one devised from such scanty materials is likely to prove imperfect in a more extended application. I do not attach much importance to this, as the temporary fabric is easily reconstructed when further information has shown its defects. But, if the standards selected possess the requisite qualities, the entireness and relative proximity of the groups may remain unaffected by any addition to their contents. The first three are so obviously indicated by external appearance, that there is little difference of opinion to be apprehended as to their existence or extent; but the combination of the fourth group rests in great part on the similarity of the trophi, since there is less resemblance in other respects between the proposed type and some of the species here associated with it, than the latter bear to a section of the genus *Perilitus*. I believe, indeed, that we should attribute this resemblance to a real affinity, and that the supposed families meet at this point. Now as they appear to approach at the other extremity also, and as the series through each, from one point of contact to the other, exhibits no manifest interruption, we have in this way a complete circle formed, to the exclusion of *Aphidius*, which seems to be thrown into a separate group. The different habits of that genus have already prepared us for such a result; but it will demand a more detailed and rigorous examination of the remaining genera than I am competent to give them, before it can be conclusively admitted. For greater convenience in designating species, the generic denomination of the type may be extended

to the entire of each group; and as Von Essenbeck has long since shown the affinity which subsists between *Chelonus* among the *Bassi* and *Microgaster* in the present family, I commence the latter with that genus. Here, however, seems to be the most convenient place to introduce a genus anomalous in its palpi, but bearing, on the whole, more resemblance to *Microgaster* than to any others of the family, although the differences are sufficient to prevent my comprehending them under one generic name, and even to leave their affinity open in some degree to doubt. This may be owing, partly, to the want of sufficient materials, the genus being founded on the examination of a single ill-preserved specimen.

GEN. II.—MIRAX.

Palpi maxillares 4-articulati, labiales 3-articulati: antennæ 14-articulatæ: occiput retusum: oculi glabri: mesothoracis scutum haud tripartitum: abdomen breve sessile: aculeus subexsertus.

Sp. *M. rufilabris*. Fem. *Niger, pedibus flavo-ferrugineis: alæ hyalinæ: os, clypeus, squamulæ et stigma ferruginea: abdominis segmenta 2 anteriora flava.* (Long. corp. .08. alar. .2.)

Caput thoracis latitudine, transversum crassum; occiput retusum; vertex late rotundatus; ocelli in triangulum; oculi parvi glabri:^e antennæ corpore parum breviores, graciles, 14-articulatæ; scapo ovato-cylindrico, pedicello extricato ovato, articulo tertio longiore quam scapo, reliquis longitudine decrescentibus: labrum transversum lateribus rotundatum, epipharynga obtegens, hujus tantum ligulâ apicali attenuata prostante; mandibulæ trigonæ apice curvatæ et tenuè bidentes; maxillæ lobus latus obtusus; labium integrum obtusum; palpi maxillares 4-articulati, articulis 1^{mo}. brevior, 2^{do}. paulo crassior; labiales 3-articulati: thorax ovatus depressus; prothorax inconspicuus; mesothoracis scutum rotundatum, planiusculum, sulculis ordinariis omnino nullis; metathorax rotundatus: alæ anticæ—stigma crassum rotundato-trigonum;

^e This character has had some weight in inducing me to separate the genus from *Microgaster*; it should be remembered, however, that the eyes are hairy in one section of the genus *Chelonus* (*Ch. sulcatus*, &c.), while they are naked in the rest.

areola disci antica parum remota; cubitalis interior sub stigmate clausa ad originem cubiti, nervum recurrentem prope apicem excipiens; cubitus obsoletus; nervi omnes exteriores evanescentes; alæ posticæ, areolâ brachiali 2^{da}. anterioris dimidiam longitudinem non æquante: pedes mediocres calcaribus parvis: abdomen thoracis longitudine, obovatum subdepressum, læve nitidum segmentis dorsi septem; ^f segmentum 1^{um}. gracile ascendens; posteriora lineari-transversa; sextum ventrale leviter carinatum, apice productum aculeum fulciens; aculeus apice subexertus.

GENUS III.—MICROGASTER.

Palpi maxillares 5-articulati, labiales 3-articulati: os breve: antennarum articulorum numerus determinatus mari feminaeque par: occiput concavum: oculi villosi: thorax depressus, scuto mesothoracis haud tripartito: pedes postici majores approximati: abdomen sessile aut subsessile brevissimum: valvula ventralis aculeum fulciens: corpus parvum, nigrum; modo flavo varium; rarius flavum: alæ diaphanæ.

Subgen.—ACÆLIUS.

Subgenus cum Chelono annectens.

Antennæ 20-articulatæ, scapo longiore; *feminae* apice attenuatæ revolutæ.

Occiput concavum, definitum.

Abdomen 5-annulatum.

Tibiæ posticæ subclavatæ.

Alæ anticæ stigmate rotundato; areolâ radiali incompleta arcuata; areâ cubitali ubique lata.

Subgen.—MICROGASTER.

Generis typum complectens.

Antennæ 18-articulatæ scapo minuto.

Occiput retusum.

Abdomen 8-annulatum.

Tibiæ posticæ apice truncatæ.

Alæ anticæ stigmate trigono; areolâ radiali trigona; areâ cubitali medio valde coarctata.

Posticæ arcolis radialibus 2, cubitalibus 2.

Subgen. I.—ACÆLIUS.

Adelius (lapsu calami). *Ent. Mag.* Vol. I. p. 262.

Corpus minimum: caput fere hemisphæricum, occipite contracto, concavo definito; vertice rotundato; ocelli in triangulum; oculi

^f Probably eight would be seen in recent specimens, that being the typical number in the *Ichneumonidæ*.

parvi villosi cum genis æquati: trophi fere quales *Microgastri* sed labrum minus, lineari-transversum, epipharyngis limbum undique retegens: antennæ 20-articulatæ, scapo longiusculo incrassato; flagellum *maris* gracilius filiforme; *feminae* medio crassius compressum, apice attenuatum revolutum (ut in *Chelonis feminis*): thorax fere *Microgastri*; metathoracis (i. e. *propodei*) margo posticus utrinque denticulatus: alæ anticæ—stigma semiovatum; areola disci antica vix remota: cubitus arcuatus mox abruptus, areolam radialem ovatum inchoans: areolæ cubitales 2, interior sub stigmate clausa ante originem cubiti; nervi exteriores sensim evanescent; nervus recurrens fere interstitialis: alæ posticæ, areola humeralis distincta; brachialis anterior basi sensim attenuata; posterior mediocris parum distincta; areolæ exteriores oblitteratæ: pedes postici crassi compressi, tibiis apice rotundatis, subclavatis (ut in *Chelonis* nonnullis): abdomen thorace brevius, ovatum subdepressum, segmentis dorsii 5; 1^{mo}. maximo dimidium totum obtegente, lævi; 5^{to}. minuto:—ventris 6; 6^{to}. subcarinato: aculeus vix subexertus.

Sp. 1. M. A. Germanus. Mas et Fem. *Pedibus anterioribus testaceis*. (Long. corp. .08; alar. .17.)

Fem.—Niger: os et palpi testacea: antennæ corpore longiores, medio multo crassiores: pedes anteriores testacei, coxis, trochanteribus basi, et femoribus latere supero fuscis; postici fusci, tibiis basi testaceis: alæ albidæ; stigmate fusco; medio latè infumatæ, lineolâ albida parum distincta sub basi stigmatis; squamulæ nigræ: thorax subtiliter punctulatus: abdomen læve nitidum.

Variat facie fere tota, pedibus anticis, coxis et trochanteribus testaceis.

Mas.—Antennis longioribus gracilioribus apice teretibus.

Habitat in *Salice Caprea* minus frequens.

Sp. 2. M. A. subfasciatus. Mas et Fem. *Pedibus nigris*. (Long. corp. .06; alar. .14.)

Fem.—Præcedente fere duplo minor: antennæ minus incrassatæ: palpi et tarsi anteriores fusci; trochanteres apice picei: alarum fasciæ 2 nigricantes manifestiores, lineolâ albida disjunctæ.—

Mas.—Antennæ longiores filiformes.

Habitat in *Salice argentea* littorum rarissimè.

Subgen. II.—MICROGASTER.

Microgaster *Latr. H. N. XIII. Gen. vi.*
Spinola. Ins. Lig. II. p.
144. Essenb. Act. Acad.
Tom. IX. A. D. 1818.
Curtis E. B. 321.

Ichneumon. (Sec. Leptogastr.) *Latr. H. N. III.*

Ichneumon. Fam. 2^{da}. *Jurine. (Agathide et Microdo*
commixtis.)

Vipio *Fallen. Spec. Meth. Hyme-*
nopt.

Caput oblatum, thorace angustius, antice orbiculatum; vertex arctus; occiput retusum, vix unquam definitum; ocelli fere in lineam curvam; oculi ovati parum prominuli, villosi; facies supra clypeum leviter bifoveolata: labrum transversum lateribus rotundatum, epipharynga obtegens, hujus tantum ligula apicali attenuata prostante; mandibulæ curvatæ, apice bidentes; maxillæ lobus rotundatus; labium integrum obtusum; palpi maxillares articulis 5, 1^{mo}. brevior, 2^{do}. crassior; labiales 3-articulati: antennæ 18-articulatæ corpore longiores vel breviores; *maris* sæpe incrassatæ apice attenuatæ; *feminae* breviores et graciliores; scapus perbrevis ovatus; pedicellus fere retractus; articuli reliqui cylindrici, striati, medio cingulati quasi duplicati: thorax oblongus subdepressus; prothorax inconspicuus; mesothoracis scutum rotundatum planiusculum, absque sulculis ordinariis; scutellum trigonum planiusculum; metathoracis scutellum distinctum foveolatum; postscutellum (*Propodeon*) undique discretum, segmento 1^{mo}. (*Metapodeo*) sæpius conforme et pariter exculptum: alæ anticæ latiusculæ; stigma trigonum; areola disci antica remota quinque angularis; cubitus fere rectangulatus flexus, areolam radialem trigonam paulo ante apicem alæ concludens; area cubitalis sub angulo cubiti valde coarctata, areolâ intermedia ibidem, trigona seu stapiæformi minuta, aut nulla; areola interior nervum recurrentem excipit; areola brachialis posterior ultra anteriorem elongata; posterior disci brevissima: alæ posticæ— areola brachialis anterior angusta, ante medium subito coarctata sub sinu nervi subcostalis, apice cum cubitali contigua; posterior illâ plus duplo brevior, vix longior quam latior; radiales 2, interior minor; cubitales 2, interior brevissima: pedes postici

approximati elongati et sæpius incrassati, femoribus compressis, coxis magnis, tibiis apice truncatis; calcaria plerisque elongata subulata: abdomen sessile aut subsessile thoracis longitudine vel eo brevius, segmentis dorsi octo, ventris sex: segmenta anteriora multimodis difformia, primi scutum dorsale plerisque angustatum, latera membranacea utrinque retegens ultimum minutissimum; ventris segmenta anteriora plerunque pallido pellucunt, sextum carinatum aculeum fulciens nec libere mobile ut in *Agathide*: aculeus modo subexertus vel reconditus, modo abdominis longitudine et apice decurvus.

Lepidopterorum larvis genus maxime infestum. Mater erucam vix repugnantem insiliens, terebræ ictu repetito ova plurima cuti infigit (vel pilis agglutinat?):^c larvæ hinc enatæ intra corpus erucæ degunt gregarie adipem depastæ extis intactis; maturæ mox erucæ cute perforatâ undique prorumpunt, et statim metamorphosi se accingunt, folliculum subcylindricum e serico subtili sibi cuique nentes; quos modo annectunt ramulo, lateribus ad invicem agglutinatos et in modum alvearis laminæ dispositos; modo foliis, parietibus, arborum truncis, seriatim vel temere aggregatos, reticulo laxiore universis substrato; vel denique cunctos intra globum spissum bombacinum obtectos culmo graminis alligant. Metamorphosin peragunt intra paucas septimanas; alii hyemem in folliculis durant, pro anni tempore. Insectum in pupario latet corpore extenso, antennis et pedibus inflexis. Folliculi operculis pulsu capitis excussis, declaratis dant exitum. Ut hi erucas sic ipsos Crypti nonnulli minores enecant; saucii tamen folliculos ut integri faciunt, at non sibi.^h

^c *Ichneumon necator*. Scharfenberg.

^h The cocoons of this tribe are composed of a very fine glossy silk of one colour, which can be wound off like that of the silkworm, while in most of the remaining *Ichneumones* they are of a gummy texture and banded. They are arranged in various modes, examples of which, and a minute account of the process of construction, may be found in the second volume of Reaumur's Memoirs. The larvæ are generally supplied with a two-fold secretion of silk; that which comes out first being of a looser and coarser texture, and serving for a common envelope for the whole society. The sections into which the genus has been divided, do not appear to be characterised by a particular disposition of the cocoons, as this differs in species the most nearly related. Some are collected into a ball, and entirely concealed within a thick cottony mass attached to a stalk of grass (as *M. globatus*, *intricatus*, &c.); others are fastened round a twig, and arranged side by side, like the cells of a honeycomb (*M. alvearius*, *alvearifer*). In many they are scattered, or collected in an irregular heap, and covered with a loose web of open texture, but tough, as is the case with *M. glomeratus*, the most familiar species, which keeps down the numbers of the common white butterfly. A correspondent in Loudon's Magazine, Vol. III. p. 52, affirms that the caterpillar of the butterfly

SECTIO A.

Areolæ cubitales tres in alis anticis. (Trichori.)

(A.) a.

Abdomen depressum rotundatum læve: aculeus reconditus: alæ coloratæ; anticæ areola radiali angustiore acuminata, cubitali intermedia distincta: pedes postici minus elongati: calcaria minuta: statura mediocris.

Sp. 3. M. mediator. Mas et Fem. *Abdomine antice pedibusque flavo-ferrugineis; segmenti primi vittâ nigrâ.* (Long. corp. .16; alar. .33.)

Fem.—Niger, capite et thorace granulato-opacis, pallido-pubescentibus: antennæ graciles corpore longiores: palpi flavi: pedes graciles flavo-ferruginei, posticorum coxæ basi et tarsi nigro-fusca: alæ flavescentes aut ferrugineæ, stigmatè fusco basi determinatè pallido; squamulæ flavo-ferrugineæ: metathorax rugulosus: abdomen obovatum planum, læve nitidum; segmenta 1^{um}, 2^{um}, et 3^{ti}. basis plerunque flavo-ferruginea aut fulva; primi scutum lineare elevatum, punctatum, nigrum; 2^{di}. latera arcuato-impressa.

Variat, segmenti primi lateribus membranaceis infra scutum lineare contractis, unde abdomen subpetiolatum evadat; his etiam segmenta intermedia obscuriora; tibiæ posticæ et tarsi intermedii apice fusca.

Variat, antennis subtus et pedibus totis flavo-ferrugineis.

Variat, coxis omnibus, femoribus intermediis basi, posticis totis nigro-fuscis; alis fusco-ferrugineis; abdominis basi obscurius rufescente.

spins the outer web over its parasites, and Goedart has written the same. Madame Merian has a similar statement relative to the caterpillar of *Cynthia Cardui*, and its *Microgaster*. I am more inclined, however, to place my faith in the usual accuracy of Reaumur. It would be a singular fact, that the caterpillar of a butterfly which, for its own transformation, produces only a few threads, which fasten the tail and girt the middle of the chrysalis, should become provided with this superabundant supply in consequence of its interior being nearly devoured. In the case of those species, indeed, which infest the tribes of *Bombyces* and *Arctiæ*, it appears that the imperfect cocoon spun by the caterpillar may serve for the envelope of its parasites (see *M. consularis*, No. 15). In general they are found in Lepidopterous larvæ; but Mr. Curtis has obtained one species out of that of an aphidivorous fly.

Mas.—A *feminâ* vix distinguendus antennis paullo longioribus.

Habitat in agris autumnò passim; varietates α , β , frequentes; γ , δ , rarissimè.—(*Mus. Soc. Ent.*)

Sp. 4. *M. spectabilis*. Fem. *Femoribus anticis, tibiis tarsisque testaceis; alis ferrugineis, fasciolâ albidâ; antennis brevissimis.* (Long. corp. .13; alar. .25.)

Fem.—Niger capite thoraceque granulato-opacis, pallido-pubescentibus: occiput lævissimum definitum: antennæ capite cum thorace paulo longiores: palpi ferruginei: femora media medio, postica tota, coxæque omnes nigro-fusca: alæ dilute ferrugineæ; stigma nigro-fuscum, basi determinate pallidum, excurrit hinc fascia linearis albida trans alam; areola radialis insuper medio pallescit; squamulæ fusco-ferrugineæ: metathorax brevior quam præcedenti, rotundato-declivis, rugulosus: abdomen ovatum planum, læve nitidum, lateribus baseos sordide flavis; segmentum primum ascendens, scuto oblongo elevato, punctulato, medio levigato: valvula ventralis apice hians etsi aculeus penitus sit absconditus: pedes breviores quam præcedenti, calcaribus paulo longioribus.

Habitat in Hibernia boreali rarissimè.

Sp. 5. *M. ingratus*. Fem. *Pedibus rufis; coxis nigris; alis fucis.* (Long. corp. .18; alar. .36.)

Fem.—Brevis crassus niger: antennæ corpore longiores crassiusculæ: palpi apice ferruginei: pedes validi, rufo-ferruginei; coxis et trochanteribus nigris; tibiis posticis apice et tarsis iisdem fuscis; calcaria minuta fusca: alæ fuscae, costa latissimâ interne flavente; stigma basi flavescens; squamulæ obscure ferrugineæ: metathorax brevis rugulosus: abdomen breviter ovatum subdepressum; segmenti 1^{mi}. ascendentis scutum convexum læve subquadratum, latera anguste lutescentia; anus rotundatus: aculeus (si revera *femina* sit) penitus absconditus.

Habitat———(*Mus. J. Curtis.*)

Sectio (A.) b.

Abdomen subtus compressum, dorso planum, segmentis anterioribus latis aciculatis: aculeus exertus, valvulis subclavatis: alæ ut præcedentibus: pedes postici crassi: calcaria longa: statura major.

1°. *Segmentis tribus aciculatis.*

Sp. 6. *M. infumatus*. Mas. *Pedibus rufis, coxis nigris.*
(Long. corp. .2; alar. 42.)

Microgaster deprimator. *Curt. E. B.* 321. No. 1.

Mas.—*M. globato* duplo major; niger: mandibularum cuspis palpique obscure rufi: pedes rufi trochanteribus concoloribus, coxis et unguibus nigris: alæ fuscae, stigmatē toto intensius concolore: abdominis segmenta 4^{um}, et sequentia conjunctim vix longitudine primi, lævia.

Habitat "Prodiit e larvis *Acronyctæ Salicis*, mense Septembre."
Curtis. l. l.—(*Mus. J. Curtis.*)

Sp. 7. *M. russatus*. Mas et Fem. *Abdomine pedibusque rufis; ano nigro.*

Fem.—Niger: antennæ corpore parum longiores, subtus rufæ: mandibularum cuspis palpique rufi: pedes crassi rufi coxis concoloribus; postici apice summo tibiæ et tarsorum fuscis; ungues nigri: alæ fusco-ferrugineæ intus lutescentes; stigma subfuscum, basi flavum; squamulæ fuscae: areola minor quam præcedenti: thoracis scutum nitidum punctulatum, dorso medio depressum et obsoletius trilineatum; metathorax quadratus, magis angulatus quam in illo, rugulosus: abdomen segmentis tribus anterioribus rugulosis rufis; reliquis lævissimis dorso nigris; subtus totum rufum: aculeus segmento primo longior, valvulis nigris. (Long. corp. .2; alar. 42.)

Mas.—Præcedentis mare longior: antennæ corpore dimidio longiores, articulis singulis valde elongatis: abdomen solito longius. (Long. corp. 23.)

Habitat in littoribus limosis Hiberniæ borealis rarissimè.—(*Mus. Soc. Ent.*)

2°. *Segmentis duobus aciculatis.*

Sp. 8. *M. globatus*. Mas et Fem. *Pedibus rufis; coxis nigris.* Fem. *Aculeo abdominis dimidio brevior.* (Long. corp. .17; alar. 36.)

Ichneumon globatus **Linn. Fn. S.* 1645.

gossypinus. (*Retz.*) *De Geer. I. T.* 29. F. 13, 14.

Geoffr. II. p. 320.

Cryptus globatus . . . *Fabr. Syst. Piez.* 89. 88.

Microgaster globatus . *Spin. Ins. Lig.* II. p. 147. No. 1.

Ichneumon globator . *Thunb. Act. Petr.* IX. p. 349.

Fem.—*Niger* : mandibulæ apice rufæ; palpi pallidiores : pedes rufi, coxis et trochanterum basi nigris : alæ flavescentes apice fuscescentes; stigma fuscum : venter antice rufo pellucens; aculeus vix longitudine segmentorum 2 anteriorum.—*Mas.* similis, antennis longioribus, abdomina magis oblongo.

Habitat in agris æstate et autumnò passim frequens :—" In graminum culmis circa autumnum in pratis non infrequens est folliculus sericeus magnitudine ovi columbini solitarius albus e quo prodeunt numerosi *Ichneumones*." *Linné l. l.*—*Fabricius* adjicit "in *Phalenarum* larvis."—Synonyma vero a Linneo et Fabricio huc adscita cautius excutienda sunt, quum uterque potius folliculos conglobatos (quod pluribus et longe diversis speciebus commune accidit) quam auctorum descriptiones respexisse videtur.—(*Mus. Soc. Ent.*)

Sp. 9. *M. annulipes*. *Fem.* *Pedibus rufis, posticis fusco-annulatis; coxis nigris; aculeo abdomine parum brevior.*

Microgaster annulipes. *Curtis. E. B.* 321. No. 4.

Fem.—*M. globato* æqualis et simillimus : antennæ subtus rufescentes : pedum posticorum femora et tibiæ apice, digitique singuli fusco-annulata : abdominis segmentum 3^{ti}um. basi punctulatum; venter totus rufescens.

Habitat "in larvis *Bombycis* cujusdam : folliculi albi." *Curtis. l. l.*
—(*Mus. J. Curtis.*)

Sp. 10. *M. Spinolæ*. *Mas et Fem.* *Pedibus rufis, basi nigris; alis apice denigratis.* *Fem.* *Aculeo brevi.*
(*Long. corp.* .19; *alar.* .41.)

Fem.—*M. russato* brevior at robustior; ater dense atro-pubescent : antennæ crassiores quam in præcedentibus : palpi rufi : pedes omnium longe validissimi, rufi coxis et trochanteribus totis nigris; femora intermedia basi præsertim subtus, antica et postica perbrevispatio aut vix, nigricantia; tibiæ posticæ basi ipsâ pallidiores, apice summo fuscæ; tarsi postici et ungues omnes fusi : alæ

pallide flavescentes, nigredine apicis oblique definitâ; stigma sub-fuscum basi sordide lutescens: segmentum tertium obsoletissime punctulatum; aculeus segmentis 2 anterioribus conjunctim brevior.—*Mas*. antennis eximie incrassatis, apice attenuatis.

Habitat in littoribus limosi Hiberniæ borealis at infrequens.—(*Mus. Soc. Ent.*)

Sp. 11. *M. meridianus*. Mas et Fem. *Pedibus rufis, basi nigris; alis infuscatiss.* Fem. *Aculeo abdominis dimidio longiore.* (Long. corp. .16—.18; alar. .36—.40.)

Fem.—Palpi nigri aut fuscii: femora antica basi, media latius aut fere tota nigra; postica rufa lineolâ superâ et aliâ inferâ, vel puncto tantum nigricantibus; tarsi apice fuscii: alæ nebulosæ fuscæ, stigmate fusco-ferrugineo: aculeus multo longior et crassior quam sequenti, pro cujus varietate aliter duxerim.—*Mas* similis.

Habitat cum sequente rarissime.

Sp. 12. *M. messorius*. Mas et Fem. *Tibiis testaceis; alis denigratis.* Fem. *Aculeo abdominis dimidio brevior.* (Long. corp. .15—.18; alar. .30—.36.)

Fem.—*M. globato* plerumque minor, præsertim brevior, antennis brevioribus: niger pubescens: palpi nigri vel apice rufescentes: femora antica apice et tibiæ testacea, postica apice fusca; tarsi anteriores testacei apice fuscii: alæ dorso incumbentes fere carbonariæ videntur; anticæ vel fusæ infuscatae ut in præcedente; vel basi pallidæ, apice nigricantes; fasciis insuper duabus irregularibus fractis et vix distinctis (alterâ sub stigmate, alterâ interiore), nigricantibus; stigma fuscum: posticæ nigricantes, prope costam intus pallescentes: metathorax brevior quam *M. globato*, et abdomen medio latius: aculeus segmentis 2 anterioribus conjunctim fere brevior.—*Mas*, antennis incrassatis (minus tamen quam *M. Spiniolæ*), et apice attenuatis.

Variat Fem. rarius, femoribus rufis, anticis basi, posterioribus supra et subtus nigricantibus.

Habitat in pratis æstate et autumnò passim frequens.—(*Mus. Soc. Ent.*)

Sp. 13. *M. luctuosus*. Mas. *Tibiis anterioribus rufescentibus; alis infuscatiss; segmenti 1^{mi}. punctis lateralibus apicis luteis.* (Long. corp. .18; alar. .36.)

Mas.—*Niger pubescens*: palpi nigri: genua, tibiæ tarsique antici et calcaria rufescentia; tibiæ intermediæ apice fuscæ, posticæ vix basi summa rufescentes: alæ fuscæ nebulosæ, stigmatibus fusco: abdomen subrotundatum segmentis 2 equidem rugulosis, sed primi scuto angustiore quam secundo, unde margines illius laterales membranacei lutei extant. *Hic itaque in sectionem A. a. quodammodo prodendet.*

Habitat in Anglia meridionali mihi semel captus.

Sectio (A.) c.

Abdomen subcompressum segmento primo angustato: aculeus brevissimus: areola minutissima, fere imperfecta: alæ hyalinæ; areola radialis latior in apicem rectâ excurrens: pedes postici elongati: calcaria longa: statura parva. *Patet itaque hos in sectionem B. transitum parare. Differunt autem constanter, areâ cubitali multo magis coarctata.*

Sp. 14. *M. alvearius*. Mas et Fem. *Flavus thorace postice abdominisque dorso nigris*. (Long. corp. .12; alar. .22.)

* Réaumur II. T. 35. F. 7.
Mem. 11. p. 432.

L'Ichneumon a coques en }
forme de rayons de ruche. } Geoffr. II. p. 322. No. 2.

Ichneumon alvearius *Fabr. Suppl.* 232. n. 232.

Cryptus *Fabr. Syst. Piez.* 90. n. 91.

Microgaster alvearius *Spin. I. L.* II. p. 149. n. 6.
Curtis. E. B. 321. fig. *ibid.*
No. 6.

Fem.—Flavo-ferrugineus: antennæ corpore parum longiores fuscæ, base subtus ferrugineæ: ocelli fusco-cincti: oculi fusci: pedes pallidiores; posticorum femora et tibiæ apice, tarsique fere toti fusciscentia: alæ hyalinæ, stigmatibus nervisque nonnullis dilute ferrugineis, plerisque decoloribus: metathorax supra nigricans, punctatus: segmentum 1^{um}. scuto angustiore aciculato, lateribus flavum; 2^{dum}. aciculatum, 3^{tio}. non brevius; reliqua lævia: venter antice flavus, postice niger: aculeus vix subexertus.—*Mas similis.*

Habitat "in *Phalenæ Crategatæ* larvis: folliculi albi, circa ramulum alvearis modo ordinati."—(*Mus. J. Curtis.*)

Sp. 15. *M. consularis*. Mas et Fem. *Antennis subtus pedibusque flavo-ferrugineis, posticorum geniculis fuscis.* (Long. corp. .14; alar. .3.)

Fem.—Niger: antennæ corpore longiores subtus latè rufescentes: os ferrugineum; palpi pallide flavi: pedes flavo-ferruginei; posticorum coxæ latere extero, femora et tibiæ apice, tarsique fere toti fuscescentia: alæ hyalinæ, stigmate ferrugineo basi pallidiore; nervis disci medii ferrugineis, exterioribus decoloribus, interioribus flavicantibus; squamulæ ferruginæ: thorax confertim punctulatus; metathorax subtiliter aciculatus: segmentum primum scuto oblongo aciculato, lateribus flavis; 2^{dum}. breve apice bisinuaturn, obsoletius aciculatum; reliqua fere lævia: venter flavescens postice niger.—*Mas*, antennæ subtus basi tantum rufescentes: stigma totum fuscum.

Habitat in larvâ pilosâ *Arctiæ*, quæ folliculos hujus conglobatos secum una reticulo laxo filorum pilis suis commixto involverat in folio *Rubi* prope Londinum. Folliculi candidi.—(*Mus. G. C. Hyndman.*)

Sp. 16. *M. flavipes*. Fem. *Antennis subtus pedibusque flavis; coxis posticis nigris.* (Long. corp. .1; alar. .22.)

Fem.—*M. alveario* gracilior: niger: antennæ breviores articulis apicis magis discretis; flavæ, supra fuscae, scapo et apice toto concoloribus: os, palpi pedesque flavi; unguiculi tantum sub-fusci; coxæ posticæ totæ nigrae: alæ hyalinæ stigmate dilute ferrugineo, nervis disci medii perpaucis pallidioribus, reliquis decoloribus; radix et squamulæ flavæ: thorax subtilissime punctulatus; metathorax sublævis: segmentum primum scuto angustiore oblongo aciculato; 2^{dum}. 3^{tio}. haud brevius, subtilius aciculatum; reliqua lævia: ventris latera pallide flava.

Habitat in *Corylo* Hiberniæ borealis rarissimè.

Sp. 17. *M. calceatus*. Fem. *Pedibus flavo-ferrugineis; posticis fusco variis, coxisque nigris; alis apice denigratis.* (Long. corp. .17; alar. .4.)

Fem.—Niger nitidus: antennæ corpore longiores, teretes, totæ nigrae: palpi flavescents apice fusci: pedes anteriores flavo-ferruginei tarsis fuscescentibus; posticorum coxæ nigrae, femora ferruginea apice fusca, tibiæ pallidæ apice tarsisque fuscis: alæ limpidæ apice denigratæ, stigmate nigro-piceo, nervis fuscis, squamulis piceo-stramincis: thorax subtilissime punctulatus;

metathorax rotundatus: segmentum primum brevius quam præcedentibus, scuto latiore elevato, apice rotundato, lateribus luteis; 2^{dum}. 3^{tio}. æquale, bistriatum; reliqua lævia: ventris latera antice sordide lutescentia.

Habitat Hiberniam borealem; in gramine captus, semel.

Sectio B.

Areolæ cubitales duæ. (Dichori.)

Alæ hyalinæ; areola radialis latior, in apicem recta excurrens; posticarum areolæ radiales et cubitales propter nervos decolores minus conspicuæ, at luminis obliquo reflexu semper distinguendæ: calcaria longa: statura parva.

Incipit ordo a speciebus longè-aculeatis, abdominis dorso planiusculo, segmenti 1^{mi}. scuto oblongo. Mediante *M. Umbellatarum* (No. 33.) attingimus species paucas (No. 34—38.) abdomine compresso, segmenti ejusdem scuto tenuissimo insignes: aculeus illis modo porrectus, modo brevissimus; sequentibus semper brevissimus quarum proximæ propter scutum illud adhuc angustatum, *M. glomeratum* (No. 41.) mox inducunt: deinde reliquarum usque in calcem, segmenta anteriora fere æquilata aciculata Sectionem A. b. quodammodo referunt.

Sp. 18. *M. equestris*. *Squamulis et pedibus fulvis, coxis nigris*. Fem. *Valculâ ventrali subtruncata; aculeo elongato arcuato*. Mas. *Forcepe anali crasso exerto*. (Long. corp. .15—.17; alar. .34—.36.)

M. globato gracilior at vix minor ideoque maximus ex hac sectione.—Fem. antennæ corpore breviores: palpi picei: pedes fulvi; tarsi posteriores fusciscentes; coxæ nigræ intermediæ apice fulvæ: alæ flavescentes, stigmatibus fusco-ferrugineo; nervis fuscis, interioribus flavicantibus; squamulæ fulvæ: thorax nitidus; metathorax subtiliter punctulatus: segmenti 1^{mi}. scutum angustum subtilissime punctulatum 2^{dum}. breve tripartitum lateribus fulvescens: venter antice rufo pellucens, segmentis anterioribus brevissimis; 6^{to}. maximo oblique truncato, anum non attingente, nec acuminatâ ut in plerisque speciebus aculeo longo præditis: aculeus abdomine parum brevior deorsum curvatus.—Mas. antennæ corpore longiores graciles: femorum posteriorum linea supera, tibiæque eadem apice fusciscentes: forceps analis ingens penitus exertus.

Habitat in pratis herbidis æstate et autumnò passim frequens; in floribus *Jacobeæ* apicans.—(*Mus. Soc. Ent.*)

Sp. 19. *M. albipennis*. *Thorace lævissimo ; tibiis basi ferrugineis ; alis albis, stigmatè flavo-piceo*. Fem. *Aculeo elongato arcuato*. Mas. *Forcipe anali exerto*. (Long. alar. .22.)

Fem.—*M. candidato* (No. 21) simillimus dimidio minor, statura longior : pedes graciliores picei, tibiis basi tantum ferrugineis : stigma flavo-piceum, cubiti basis et costa concolores, nervi reliqui albi : aculeus quam illi manifeste longior et crassior, arcuatus ut in præcedente fere, sed valvula ventralis cuspidata anum equans.

Habitat in arvis autumnò minus frequens.—(*Mus. Soc. Ent.*)

Sp. 20. *M. infimus*. Mas et Fem. *Thorace lævissimo ; tibiis basi fuscis ; alis obscuris*. Fem. *Aculeo dimidii abdominis longitudine*. (Long. alar. .20—.24.)

Parvus præcedente vix major : antennæ *feminae* longiores : tibiæ in utroque sexu basi summa fusco-ferrugineæ : alæ obscuræ aut fere exalbidæ, stigmatè nervisque piceis : metathorax lateribus vage punctulatus : abdomen quam illi brevius ; segmenta antica conformia : aculeus crassiusculus rectus valvulæ ventrali incumbens.

Habitat ad litora minus frequens.—(*Mus. Soc. Ent.*)

Sp. 21. *M. candidatus*. *Thorace lævissimo ; alis niveis stigmatè nigro*. Fem. *Tibiis basi, anticis totis flavo-ferrugineis ; aculeo abdomine parum brevior*. Mas. *Tibiis basi ferrugineis ; segmenti primi scuto apice subrotundato*. (Long. corp. .13 ; alar. .27.)

M. glomerato æqualis : niger sericeus (i. e. subtilissimè albo-pubescent).—Fem. antennæ corpore breviores planè filiformes : palpi fusi : pedum anticorum genua, tibiæ tarsique, posteriorum tibiæ basi flavo-ferruginea : alæ nivææ, nervis nonnullis disci medii piceis, reliquis albis ; stigma nigro-piceum, costa concolor basi flavescens : thorax lævissimus : segmenti 1^{mi}. scutum oblongo-quadratum et reliqua lævissima : aculeus abdomine brevior gracilis, perparum curvatus : valvula ventralis cuspidata anum æquans ut in plerisque.—Mas, antennæ corpore longiores teretes ; tibiæ anticæ medio infuscatæ : alarum costa latius, et nervi plures nigricantes : segmenti 1^{mi}. scutum multo angustius, apice subrotundatum ; 2^{dum}. arcuato impressum.

Habitat in *Salice argentea* arenarum, et alibi litorum satis frequens.—(*Mus. Soc. Ent.*)

Sp. 22. *M. Xanthostigma*. Mas. *Thorace lævissimo; tibiis basi, anticis totis flavis; alis candidis, stigmatè flavo.*

Mas.—Præcedenti æqualis et simillimus: palpi flavi, basi fusci: alæ candidæ; stigma flavum, nervo ambiente et subcostali nigricantibus; costali et cubiti basi stramineis; reliquis albis.

Habitat in gramine bis atque iterum lectus.

Sp. 23. *M. lacteipennis*. Mas. *Thorace lævissimo; tibiis basi flavo-ferrugineis; alis niveis, stigmatè nigro; segmenti 1^{mi}. scuto apice æquilato.* (Long. corp. .15; alar. .32.)

Curt. E. B. 321. n. 10.

Mas.—*M. candidato* simillimus plusquam dimidio major: antennæ validiores: alarum costa et stigma nigro-picea; cubitus basi ferrugineus; nervi reliqui candidi: segmenti primi scutum quam illius *mari* latius, apice non attenuatum nec rotundatum; secundi lineola tantum lateralis impressa.

Habitat ————— (*Mus. J. Curtis.*)

Sp. 24. *M. annularis*. Mas et Fem. *Thorace lævissimo; pedibus anterioribus, posticorum tibiis tarsisque basi et squamulis flavis; stigmatè bicolore.* Fem. *Aculeo abdomine brevior.*

Fem.—*M. candidato* paullo minor brevior: niger sericeus: antennæ corpore parum breviores, graciles planè filiformes, articulis vix manifeste discretis: palpi flavi: pedes anteriores flavi; coxis nigris; femora media basi infuscata; posticorum tibiæ et metatarsi basi flava: alæ limpidæ aut stramineo-candidæ; stigma fuscum basi pallidum; nervi nonnulli disci medii subfusci, reliqui decolores: costa interiùs, radix et squamulæ pallidè flavæ: abdomen paulo brevius quam *M. candidato*, lateribus ventris flavo-pellucidis: aculeus ut illi: valvula ventralis minus acuta.—*Mas* concolor; antennæ elongatæ gracillimæ apice teretes.

Habitat in *Corylo* minus frequens.

Variat, Fem.—Major, antennis paulo brevioribus: femora intermedia latius tibiæque eadem apice fusca: stigmati punctum pallidum minutum: squamulæ basi et humeri fusca.

Habitat in *Salice Russelliana* mihi lectus rarissimè.—(*Mus. Soc. Ent.*)

Variat, Mas.—Palpi basi fusci : pedes antichi basi nigri ; posteriorum tibiæ basi, tarsi latiûs ; mediorum femora insuper apice flava : alarum stigma dilutius, basi pallescens ; squamulæ nigræ : annon distincta species ?

Habitat adsunt exemplaria 4 nescio ubi capta.—(*Mus. Soc. Ent.*)

Sp. 25. *M. decorus*. Fem. *Thorace lævi ; pedibus fulvis, coxis nigris ; valvulâ ventrali acuminata ; aculeo abdominis longitudine*. (Long. corp. .14 ; alar. .30.)

Fem.—*M. glomerato* major : antennæ corporis longitudine apice teretes : palpi pallide ferruginei basi fusci : pedes fulvi aut ferruginei ; trochanteres antichi sæpius concolores, postici et coxæ nigra ; femora puncto infero baseos, postica lineolâ superâ fuscis ; tibiæ posticæ summâ basi pallidiores, apice fuscae ; tarsi iidem fere toti fusci : calcaria pallida : signaturæ pedum vero modo manifestiores extant modo obsoletissimæ : alæ amplæ hyalinæ, stigmate fusco-ferrugineo ; squamulis nigris : thorax lævis nitidus : segmento 1^m, scutum oblongum læve ; venter rufo-pellucens.

Variat, Fem.—Pedes fusci, anticorum femora et tibiæ subtus, posteriorum femora lineolâ longitudinali tibiæque basi ferruginea.—*Mas.* concolor (huic varietati) *feminæ* : antennæ multo longiores.

Habitat in *Quercu, Larice* passim minus frequens.—(*Mus. Soc. Ent.*)

Sp. 26. *M. hilaris*. Fem. *Thorace subtilissime punctulato ; squamulis et tibiis flavo-testaceis, posticis apice fuscis ; stigmate bicolore ; aculeo abdominis longitudine*.

Fem.—Statura et magnitudo præcedentis : antennæ corpore longiores teretes : palpi flavi : femora antica basi nigra, intermedia summo apice ; tarsi anteriores, basis summa posticorum, et tibiæ flavo testacea ; tibiæ posteriores apice fuscae : alæ amplæ hyalinæ, stigmate fusco-ferrugineo basi flavo ; nervis disci medii dilute ferrugineis, exterioribus decoloribus, interioribus flaventibus : squamulæ flavo-testaceæ : thorax nitidus dorso subtilissime punctulatus lineolâ longitudinali et scutelli medio lævigatis ; meta-thorax et segmenti primi scutum punctulata.

Sp. 27. *M. contaminatus*. Fem. *Thorace punctulato ; squamulis tibiis tarsisque testaceis ; aculeo abdomine brevior*. (Long. alar. .32.)

Fem.—Præcedentibus æqualis, abdomine brevior obtuso : antennæ corpore fere longiores teretiusculæ : palpi, femora antica basi

nigra, posteriora summo apice, tibiæ tarsique flavo-testacea: alæ amplæ obscure flavescens, stigmatè nervisque piceo-flavis; squamulæ flavo-testaceæ: thorax punctulatus; metathorax et segmenta 2 anteriora aciculata.

Habitat lectus in nemore sub-montibus Mourne, Hiberniæ borealis, mense Julio.

Sp. 28. *M. arenarius*. *Thorace punctatissimo; alis obscure-hyalinis*. Fem. *Tibiis ferrugineis, posticis apice fuscis; valvula ventrali anum longe superante pallida; aculeo abdomine brevior*. Mas. *Tibiis basi ferrugineis*. (Long. alar. .25—.28.)

Fem.—*M. glomerato* paullo major: antennæ corpore breviores: palpi ferruginei basi fusci: femora antica apice, tarsi iidem toti, intermediis basi, tibiæ et calcaria ferruginea; harum posticæ apice fusæ: alæ obscure hyalinæ, stigmatè nervisque fusco-ferrugineis; squamulis nigris: thorax confertim punctatus, prope medium dorsi utrinque subdepressus; metathorax punctato reticulatus: segmenti 1^{mi}. scutum paulo longius quam latius, apice nonnihil dilatatum punctato-reticulatum; 2^{dum}. brevissimum subtilius aciculatum, lateribus læve: valvula ventralis pallida anum longè superans, compressa apice non acuminata: aculeus abdominis dimidio longior.—*Mas*, antennæ corpore multo longiores; tibiæ anticæ medio, et tarsi latius infuscata; tibiæ posteriores basi tantum ferruginæ.

Habitat in *Salice argenteo* arenarum æstate copiosè.—(*Mus. Soc. Ent.*)

Sp. 29. *M. sodalis*. Fem. *Thorace punctulato; tibiis basi, anticis totis flavo-testaceis; alis albidis, stigmatè stramineo; aculeo abdomine brevior*.

Fem.—Præcedenti æqualis et non dissimilis, sculpturâ multo subtiliore: antennæ longiores; color tibiarum et calcarium pallidior, illarum posteriores latius fusæ: alæ albidæ aut fere hyalinæ, stigmatè obscure stramineo: thorax dorso non impressus: segmentum 1^{um}. angustius; 2^{dum}. longius quam illi: valvula ventralis anum æquans.

Sp. 30. *M. dilectus*. Fem. *Thorace granulato; pedibus flavo-testaceis, posterioribus fusco-nebulosis; coxis nigris; stigmatè bicolore; aculeo dimidii abdominis longitudine*.

Fem.—*M. glomerato* fere brevior: antennæ corporis longitudine apice crassiusculæ: palpi pallidè flavi basi fusci: pedes flavo-testacei, coxis nigris; femora posteriora saturatiora, supra et subtus infuscata; tibiæ posticæ et tarsi summo apice fuscescentia: alæ hyalinæ; nervis pallide ferrugineis, interioribus flavicantibus, exterioribus decoloribus; stigma fusco-ferrugineum, basi flaves-cens; squamulæ nigræ: thorax confertim subtilissime punctulatus opacus: abdomen breve, segmenti 1^{mi}. scuto oblongo punctulato.

Habitat in *Salice* rarius.

Sp. 31. *M. coniferæ*. Mas et Fem. *Squamulis, tibiis tarsisque flavo-testaceis; femoribus anticis concoloribus, posticis fuscis.* Fem. *Aculeo abdominis dimidio brevior.*

Fem.—*M. glomerato* æqualis: antennæ fere corporis longitudine teretiusculæ: palpi pallide flavi: pedes antici flavo-testacei coxis tantum nigris; femora intermedia lineolâ superâ et aliâ inferâ abbreviatis, postica latiûs fusca; vel hæc tota fusca relicta tantum lineola longitudinali testacea: alæ hyalinæ, stigmatibus nervisque disci dilute ferrugineis, exterioribus decoloribus; squamulæ flavo testaceæ: thorax (ob pubescentiam confertam at subtilissimam) pruinosis, fere iridescens; metathorax et segmenti 1^{mi}. scutum subtilissime aciculata; hoc angustum apice nonnihil attenuatum: aculeus anum non multum superans.—*Mas.* femora antica lineolâ superâ, posteriora fere tota fusca.

Habitat in *Laricetis* minus frequens.

Sp. 32. *M. exilis*. Fem. *Tibiis tarsisque testaceis; aculeo abdominis dimidio brevior.*

Fem.—Præcedenti quodammodo affinis; dimidio minor, antennis et pedibus gracilioribus; tibiis posterioribus versus apicem tarsisque latiûs obscurioribus: femora antica basi, intermedia apice demto, postica tota nigra: segmenti 1^{mi}. scutum gracile equidem, sed postice non attenuatum ut insequentibus, confertim punctatum.

Sp. 33. *M. Umbellatarum*. Fem. *Abdominis subcompressi lateribus, squamulis pedibusque flavo-ferrugineis, posterioribus fusco nebulosis; coxis nigris; alis flavescentibus; aculeo dimidii abdominis longitudine.* (Long. alar. .22.)

Fem.—*M. coniferæ* dimidio minor: thorace pruinoso similis, sed abdomine subcompressa, metapodeo graciliore, etc. in sequentes propendet: antennæ graciles corporis longitudine: palpi pedesque

flavo-ferruginei; coxæ nigræ; pedes posteriores fusco-signati fere ut in *M. dilecto* (No. 30): alæ obscure flavescentes, stigmatæ nervisque picco-flavis; squamulis flavo-ferrugineis: thorax lævis; metathorax vage punctulatus: abdomen breve subcompressum, lateribus baseos ferrugineis; segmenti primi scutum paullo latius quam sequentibus, postice sensim attenuatum punctulatum.

Habitat in flosculis *Angelicæ sylvestris* autumnno lectus.

Sp. 34. *M. lateralis*. Mas et Fem. *Abdominis compressi lateribus, squamulis pedibusque flavis; posticis fusco variis; coxis nigris; segmenti primi scuto gracillimo elevato*. Fem. *Aculeo dimidii abdominis longitudine*. (Long. corp. .12—.15; alar. .28—.34.)

Fem.—Antennæ corpore breviores fere filiformes: palpi pedesque flavi; posticorum coxæ nigræ, femora et tibiæ apice, tarsique fusca: alæ amplissimæ cærulescenti-hyalinæ, stigmatæ fusco; nervis exterioribus haud profecto decoloribus; squamulæ flavæ: thorax lævis pallido-pubescent; metathorax vage punctulatus: abdomen breve, valde compressum dorso fornicatum; segmenti 1^{mi}. scutum gracillimum elevatum, postice sensim attenuatum, punctulatum.—*Mas*, antennæ longiores crassiores apice teretes: abdomen minus.

Variat, Mas.—Sæpe femoribus posterioribus latere supero, tibiis intermediis apice, posticis usque ad medium infuscatis.

Habitat in gramine nemorum frequens.—(*Mus. Soc. Ent.*)

Sp. 35. *M. vitripennis*. Mas et Fem. *Abdominis compressi lateribus, squamulis pedibusque flavis; posticis fusco variis, coxis nigris; segmenti 1^{mi}. scuto gracillimo elevato*. Fem. *Aculeo brevissimo*. (Long. alar. .35.)

Curt. E. B. 321. n. 8.

Fem.—Præcedenti simillimus, sed metathorax lævis; segmenti 1^{mi}. scutum adhuc gracilius læve; abdomen brevius; aculeus tantum subexertus: segmenta 2^{dum}. et 3^{tium}. modo flava puncto tantum dorsali communi nigro, a nigredine sequentium disjuncto.—*Mas*, abdomen minutissimum coxis posticis haud multo longius, generis *Evaniæ* habitum in animum revocans.

Habitat cum præcedente rarius.—(*Mus. Soc. Ent.*)

Sp. 36. *M. callidus*. Fem. *Abdominis compressi lateribus, squamulis pedibusque flavis; posticorum coxis basi, tibiis*

apice tarsisque fuscis; segmenti primi scuto gracillimo elevato granulato; aculeo brevissimo. (Long. corp. .12; alar. .26.)

Fem.—Proxime præcedentibus affinis; *M. lateralem* segmenti primi latitudine referens (etsi punctura tam hujus segmenti quam metathoracis multo confertior sit); *M. vitripennem* vero aculeo vix subexerto; sed abdomen adhuc brevius et minus compressum: alæ minores, obscure hyalinæ; squamulæ flavæ: pedes postici magis ferruginei, coxis apice concoloribus, femoribus apice vix obscurioribus: præterea, calcaria cum *M. fulvipede*, &c. potius quam illis conveniunt.

Sp. 37. *M. exiguus.* *Fem. Abdominis compressi lateribus pedibusque pallide ferrugineis, coxis nigris; posteriorum tibiis apice, femoribus tarsisque fuscis; segmenti 1^{mi}. scuto gracillimo elevato; aculeo abdominis dimidio brevior.* (Long. alar. .22.)

Fem.—*M. vitripenni* affinis duplo minor, aculeo longiore, segmenti 1^{mi}. scuto fere lineari, calcaribus ut in *M. fulvipede*: palpi pedesque pallide ferruginei, trochanteres omnes concolores; coxæ nigræ; femora intermedia basi, postica fere tota, tibiæ posteriores apice, tarsisque (metatarsi basi demtâ) fusca: alæ cærulescenti-hyalinæ stigmate pallido; squamulis fuscis.

Habitat in Umbelliferis rarius.

Sp. 38. *M. fulvipes.* *Mas et Fem. Squamulis pedibusque fulvis; coxis posticis nigris; segmenti 1^{mi}. scuto gracillimo elevato.* *Fem. Aculeo brevissimo.* (Long. corp. .11—.14; alar. .24—.28.)

Microgaster glomeratus? *Spin. Ins. Lig. II. 149. n. 5.*

Fem.—*M. glomerato* longior: antennæ gracillimæ corpore longiores: mandibulæ apice ferruginæ; palpi flavo-ferruginei: pedes elongati graciles ferruginei aut flavo-ferruginei; coxæ posticæ nigræ apice ferruginæ; calcaria postica metatarsi dimidio breviora, intermedia metatarso breviora recta, quæ in aliis præsertim vero *M. laterali* et *vitripenni* nonnihil curvata sunt metatarsi longitudinem attingentia: alæ quam illis minores glauco-hyalinæ, stigmate sordide flavo, nervis dilute piceis; squamulis ferrugineis: thorax lævis; metathorax lateribus subtiliter punctulatus: abdomen subcompressum; segmento 1^{mi}. scutum gracillimum elevatum,

postice sensim attenuatum, subtilissime aciculatum; 2^{dum}. bi-striatum, medio obsoletiùs aciculatum, lateribus obscurè lutescens : aculeus vix subexertus.

Mas.—Antennæ corpore plusquam dimidio longiores gracillimæ : pedes paulo validiores ; posticorum tibiæ apice et tarsi nonnunquam fusciscentia : abdomen gracilius basi coarctatum.

Habitat in gramine nemorum passim frequens, ab æquinocio inde, cæteris præcocior.—(*Mus. Soc. Ent.*)

Sp. 39. *M. popularis*. *Mas.* *Thorace lævi; tibiis flavis, posticis apice et subtus fuscis; alis albidis.*

Mas.—*M. glomerato* paulo major: niger: palpi flavescentes basi fuscis: femora antica basi nigra, tibiæ tarsique flava aut flavo-testacea; tibiæ posteriores apice, posticæ etiam subtus et tarsi iidem fusca: alæ candido-hyalinæ costa et stigmate fusco-ferrugineis; nervis disci medii dilute fuscis, reliquis decoloribus: thorax lævis sericeus: segmentum 1^{um}, scuto longiore quam latiore, apice rotundato-attenuato, lævi nitido, 2^{dum}. 3^{io}. non brevius utrinque oblique impressum, medio subtiliter punctulatum; reliqua lævia nitida: statura hujus solito validior: vix dubito quidem *feminæ* aculeum fere brevem ut sequenti.

Hab.—Prodiit e folliculis albis segregatis.—(*Mus. G. C. Hyndman.*)

Sp. 40. *M. immunis*. *Fem.* *Thorace lævi; femoribus tibiisque flavo-testaceis; posterioribus illorum utrinque, harum apice, fuscis; alis hyalinis; aculeo brevissimo.*

Fem.—*M. glomerato* æqualis: antennæ longiores: palpi fuscis apice pallidi: pedes flavo-testacei, coxis et trochanterum basi nigris; femora antica summa basi, intermedia lineolâ superâ et aliâ inferâ fuscis; postica fusca plaga longitudinali testaceâ; tibiæ posticæ et tarsi posteriores apice fusciscentia: alæ hyalinæ stigmate costaque piceis: thorax lævis nitidus: segmentum 1^{um}, quam *M. glomerato* brevius scuto lateribus subrotundato medio latiore, subtiliùs aciculato; 2^{dum}, arcuato-impressum medio subtilissimè aciculatum: aculeus subexertus.

Sp. 41. *M. glomeratus*. *Mas et Fem.* *Thorace subtiliter punctulato; pedibus flavo-ferrugineis, coxis nigris, genibus posticis infuscatiss; alis limpidis.* *Fem.* *Aculeo brevissimo.* (Long. corp. .12—.14.; alar. .24—.28.)

Vermiculi e Crambide . . **Wagner. Helvet.* 226.

Musca Brassicarïæ erucæ . *Ray. Ins.* 260. *Goedart.* p. 59,
No. 11. *Reaumur.* II. T. 33.
F. 2—13. T. 34. F. 1, 2.
Mem. II. p. 419. *De Geer.* I.
T. 16. F. 6. *Geoffroy.* II.
331. 2.

Ichneumon glomeratus . *Linn. Fn. S.* 1646.

Cryptus *Fabr. Syst. Piez.* 90. 89.

Ichneumon glomerator . . *Thunb. Act. Petr.* IX. 349.

Microgaster glomeratus . *Loudon, Mag.* V. 108. fig. a—h.

Fem.—Antennæ corpore breviores palpi pedesque flavo-ferruginei; coxæ nigræ; apex femorum posticorum supra fusco-lineatus; tarsi summo apice, postici latè infuscati: alæ limpidæ stigmatè fusco-ferrugineo; nervis disci nonnullis interruptè ferrugineis, plerisque flavescentibus, exterioribus planè decoloribus; squamulæ nigræ: alarum apex solito brevior et rotundior, cubiti basis sub stigmatè nonnihil obliquatus brevior: thoracis scutum punctulatum, scutellum parum convexum; metathorax brevis punctato-reticulatus, uti etiam segmenta 2 anteriora; quorum primi scutum secundo fere dimidio angustius, longius quam latius, lateribus flavis reiectis; 2^{dum}. transversum 3^{tio}. brevius; intermedia solito longiora; ultima brevissima fornicato-deflexa: aculeus vix subextertus: venter antice flavo-pellucens.

Mas.—Antennæ corpore longiores: femora postica apice latiùs, tibiæ etiam apice infuscata; trochanteres basi nigri.

Habitat in larvis *Ponticæ Brassicæ* vulgatissimus: folliculi flavi aggregati.—(*Mus. Soc. Ent.*)

Sp. 42. M. placidus. Mas. *Thorace lævi; tibiis flavis, posticis apice fuscis; alis candidis; segmentis anterioribus latis aciculatis.* (Long. alar. .30.)

Mas.—Præcedente major: antennæ prælongæ teretes: palpi flavi basi fusci: femora antica pallide flava, basi summâ fusca; tibiæ tarsique flava; illarum posticæ apicæ, tarsique iidem fere toti fuscescentia: alæ candido-hyalinæ stigmatè fusco-ferrugineo; nervi disci medii dilute ferruginei; interiores flavescentes; exteriores decolores: squamulæ nigræ: thorax dorso lævis nitidus: metathorax punctato-reticulatus: scutum segmenti primi vix

longius quam latius, (latius quidem quam *M. glomerato* sed paulo angustius quam sequentibus); segmenta 2 anteriora aciculata.

Hab.—————(*Mus. J. Curtis.*)

Sp. 43. *M. lineola*. Mas. *Thorace subtilissimè punctulato; femoribus tibiisque flavo-testaceis; posterioribus illorum utrinque, harum apice fuscis; alis albidis; segmentis tribus aciculatis.*

Curtis. E. B. 321. n. 11.

Mas.—*M. glomerato* æqualis: palpi flavi: pedum colores quales *M. immuni* (No. 40.) fere: alæ albidæ, stigmate nervisque disci medii dilute ferrugineis, reliquis decoloribus; squamulæ nigræ: thorax confertim at subtilissime punctulatus; metathorax punctato-reticulatus: abdomen solito brevius et latius, segmentis 3 anterioribus punctato-reticulatis; primum breve latum angulis apicis vix flavo-marginatis.

Hab.—Prodiit e larvâ *Scævæ Pyrastri.*—(*Mus. J. Curtis.*)

Sp. 44. *M. præpotens*. Fem. *Thorace subtilissime punctulato; tibiis ferrugineis, posticis apice fuscis; alis limpidis; aculeo perbrevis.*

Fem.—*M. glomerato* major et adhuc robustior, antennis brevibus crassioribus: palporum et pedum colores fere quales *M. intricato* (No. 45), lætiores modo: alæ latæ apice rotundatæ (uti *M. glomerato*), limpidæ, stigmate crasso nigro-ferrugineo, nervis disci nonnullis ut in illo interrupte ferrugineis, reliquis decoloribus, costa interius flavicante; squamulæ nigræ: thorax nitidus subtilissimè punctulatus; scutellum læve; metathorax brevissimus punctato-reticulatus: segmenta 2 anteriora ut in sequentibus latitudine subæqualia, aciculata; aculeus magis exsertus quam illis.

Sp. 45. *M. intricatus*. Fem. *Thorace punctatissimo; tibiis ferrugineis, posticis apice fuscis; alis obscurè hyalinis; aculeo brevissimo.*

Fem.—*M. glomerato* fere æqualis: antennæ corporis longitudine: palpi ferruginei: femora antica basi nigra, tarsi anteriores et tibiæ ferrugineæ; harum posticæ apice (nonnunquam latiùs) fuscae: alæ obscure hyalinæ stigmate nervisque fuscis; squamulæ nigræ: thoracis dorsum opacum confertissimè, scutellum parciùs

punctatum; metathorax et segmenta duo antica punctato-reticulata aut rugulosa: aculeus vix subexertus.

Hab.—Folliculi latitabant intra globos spissos bombacinos stramineo-pallidos, graminum culmis appensos: prodiit ex his *Microgaster parciûs*, *Hemiteles fulvipes* vero copiosè.—(*Mus. G. C. Hyndman.*)

Sp. 46. *M. vestalis*. Mas et Fem. *Thorace punctatissimo; squamulis et tibiis ferrugineis, harum posticis apice fuscis; alis hyalinis.* Fem. *Aculeo brevissimo.*

Fem.—*M. intricato* simillimus: mesothoracis scutum et scutellum tota confertissime punctata opaca: alæ hyalinæ, stigmate dilutius ferrugineo; squamulæ ferrugineæ.

Sp. 47. *M. ruficrus*. Mas et Fem. *Thorace punctatissimo; squamulis pedibusque flavo-ferrugineis; posticorum coxis nigris et genubus infuscatis.* Fem. *Aculeo brevissimo.* (Long. alar. .22.)

Fem.—*M. intricati* statura et sculptura, plusquam dimidio minor: palpi flavo-ferruginei; pedes concolores; posticorum coxæ nigræ, femorum apex fusco-notatus ut in *M. glomerato*: alæ obscure hyalinæ stigmate ferrugineo.

Sp. 48. *M. gracilis*. Mas et Fem. *Thorace punctulato; tibiis flavo-ferrugineis; femoribus anticis concoloribus, posterioribus infuscatis.* Fem. *Aculeo brevissimo.*

Curt. E. B. 321. n. 12.

Fem.—Statura *M. intricati*, dimidio minor; thoracis punctura subtilior; antennæ longiores: pedes antici flavo-ferruginei, coxis et trochanteribus nigris; posteriorum femora supra et subtus fusca; tibiæ posticæ apice et tarsi latius obsoletius fusciscentia: alæ hyalinæ stigmate ferrugineo; squamulæ nigræ.

Hab.—(Mus. J. Curtis.)

Sp. 49. *M. rubripes*. Fem. *Thorace punctulato; antennis subtus, squamulis pedibusque rufis; coxis nigris; aculeo brevissimo.*

M. glomeratus. *Curt. E. B. 321. n. 7.*

Fem.—*M. glomerato* paulo major; statura fere præcedentium: antennæ corpore longiores, subtus rufescentes, basi clariùs: os

rufum, palpi pallidiores: pedes rufi, tarsi postici obscuriores; coxæ basi, posticæ totæ nigræ: alæ obscure hyalinæ stigmatæ fusco-ferrugineo; squamulæ rufæ: thorax confertim subtiliter punctulatus; metathorax et segmenta 2 anteriora aciculata: venter rufescens: aculeus vix subexertus.

Hab.—Prodiit è folliculis flavis *Hipparchi papilionarii* larvæ agglutinatis.—(*Mus. J. Curtis.*)

Sp. 50. *M. prætextatus*. Fem. *Thorace punctulato; abdomine postice, squamulis pedibusque flavo-ferrugineis; aculeo brevissimo.*

Fem.—Præcedentium statura fere, *M. glomerato* æqualis: antennæ longæ graciles: palpi pedesque flavo-ferruginei; posticorum geniculi fusco-punctati et coxæ basi fuscae: alæ obscure hyalinæ stigmatæ ferrugineo; squamulæ flavo-ferrugineæ: thorax dorso subtiliter confertim punctulatus: abdomen flavo-ferrugineum, segmentis 1^{mo}, 2^{do}, et 3^{ti}. basi dorso nigris; 7^{mo}. fuscescente: aculeus subexertus.

ADDENDUM.

Sp. 11. *M. meridianus*. (Long. corp. .18.; alar. .36.)

Fem. Variat.—Femora postica rufa apice nigra: alæ pallide flavæ, clarius pictæ, vix triangulum apicale nigricans vertice areolam attingit ibidem cum fascia transversa sinuata conjunctum; fascia interior magis obsoleta et interrupta; alarum posticarum nigredo occupat areolam cubitalem exteriorem et radialis apicem: aculeus abdominis dimidio paulo brevior. Patet itaque speciem 12^{mam}. cum hac sensim collabi et e numero specierum dimittendam esse.

Forsitan utraque cum *M. deprimatore* conjungi posset.

Hab.—Lectus in *Rosa spinosissima* arenarum die Maii 20^{mo}.

ADDENDA.

Species mihi invisæ, vel non ritè determinatæ.

Sp. 51. *M. auriculatus*.

**Fabr. Syst. Piez.* 69. 82. "Ichneumon auriculatus: ater capite abdominisque depressi segmento secundo tertioque rufis. Parvus:

antennæ supra fuscae subtus rufæ: caput rufum vertice nigro: thorax ater immaculatus: abdomen depressum petiolatum, basi apiceque nigrum: pedes rufi tarsis posticis nigris."

Spin. Ins. Lig. II. 147. 2. "Microgaster auriculatus: *niger segmentis intermediis rufis*. Alæ hyalinæ superiores fasciis 2 fuscis: abdomen segmentis 3 anterioribus rugosis."

Thunb. Act. Petr. VIII. p. 266. "Ichneumon auricator: *rufus abdominis basi ano tarsisque posticis nigris*."

In sectionem A. referendus est.

Sp. 52. *M. deprimator*.

**Panzer. Fn. Germ. 79. 11.*

Fabr. E. S. Suppl. 227. 182. "Ichneumon deprimator: *ater abdomine depresso plano, pedibus rufis*."

Spin. Ins. Lig. II. 148. 3. "Microgaster deprimator: *niger pedibus rufis, alis hyalinis fasciis 2 fuscis*. Alæ ut in *M. auriculato*: abdomen omnino nigrum, segmento primo maximo rugoso: pedes toti rufi."

Pertinet hic etiam sectionem A.

Sp. 53. *M. sessilis*.

Fabr. Ent. Syst. II. 194. 4. *Evania sessilis*, &c.

Coquebert. Ill. Dec. 1. T. 4. F. 8.

Fabr. Syst. Piez. 187. 8. "Ceropales sessilis: *atra abdomine brevi cylindrico*."

Spin. Ins. Lig. II. 148. 4. "Microgaster sessilis: *niger tibiis tarsisque rufis alis hyalinis*. Alæ profecto hyalinæ stigmate nigro: abdomen neutiquam cylindricum, sed supra depressum et subtus fornicatum, triangulare ut in reliquis Microgastribus, segmentis 1^{mo}. et 2^{do}. basi supra rugosis: pedes rufi coxis femoribus tarsisque nigris."

Sp. 54. *M. dorsalis*.

Spin. Ins. Lig. II. 151. 8. "Microgaster dorsalis: *niger ventre pedibusque rufis*. (Long. 2 linearum; lat. $\frac{1}{4}$.) Antennæ nigrae corpore longiores: caput nigrum: thorax concolor: abdomen supra nigrum segmentis 3 anterioribus rugosis, ventre rufo pallidiore: pedes rufi genubus nigris, tarsis nigro annulatis: alæ hyalinæ stigmate nigro: *femina* terebram gerit abbreviatam vix conspicuam."

Sp. 55. *M. aphidum*.

Spin. Ins. Lig. II. 150. 7. “*Microgaster aphidum*: *niger abdominis basi pedibusque quatuor anticis testaceis alis hyalinis*. Alæ hyalinæ stigmatate nigro: pedes 4 antici rufi aut testacei, postici concolores coxis femoribus nigris: abdomen supra perfecte lævigatum segmento 1^{mo}. testaceo ventre pallido.—*Var.* segmento 1^{mo}. nigro utrinque testaceo.”

N.B.—*Synonyma* a Spinola huc allata rejicienda sunt.

Sp. 56. *M. necator*.

Scharfenberg. p. 960. n. 14. “*Ichneumon necator*: *niger pedibus abdomineque flavicantibus hoc apice nigro*. (Long. $1\frac{1}{2}$ linearum.) Antennæ nigræ setacæ corpore longiores: caput et thorax nigri nitidi immaculati: alæ hyalinæ irideæ stigmatate nigro: pedes aurantiaci femoribus posticis nigris: abdomen flavum segmentis ultimis nigris: aculeus absconditus.—*Femina* agglutinat ova cuti et pilis larvarum *Bombyciæ chrysorrhææ aurifluæ*, &c. Larvæ exclusæ albæ capite acuminato perforant cutem penetrantque in corpus illarum. Initio Junii ad mutationem subeundam e corpore exeunt, sibi que folliculos parvos conficiunt angustos albos $1\frac{1}{2}$ lineas longos, socialiter aggregatos, e quibus decursu dierum 12—21, Ichneumones prorumpunt.”

Revocat auctor ad hanc speciem *Ichneumonem necatorem* Fabricii (qui a Gravenhorstio pro *Hemitele necatore* suo habetur); uterque laudavit *Ichneumonem*, Roesel. II. Vesp. T. 14. F. 3, 4. ab illorum descriptionibus tamen nonnihil discrepantem, quem Linneus ad *Ichn. glomeratum* jam antea adhibuerat, Scopoli usque ad *Ichn. globatum*. *Ichn. necatorem* Scharfenbergii, ut plures alios nimis leviter adumbratos, a cultoribus Lepidopterorum mox agnoscendum expectemus.

Sp. 57. *M. tortricis*.

Schrank. Ins. Austr. 763. *Ichneumon tortricis*: “*niger minutus abdomine ovato depresso sessili subtus pallidiore*. (Long. $1\frac{1}{2}$; alarum anticar. $1\frac{1}{2}$; aculei $\frac{1}{2}$; antennarum 1 lin.)—*Hab.* in larva *tortricis fascianæ* larvulæ duæ apodes cylindricæ lunulato inflexæ, corpore rugoso molli capite retractili, unde natum præsens insectum.”

Schr. Fn. Boica. II. p. 2. 366. n. 2143. *Ichn. tortricis*: “*niger pedibus anticis et tibiis basi pallidis, abdomine sessili ovato-subdepresso*. Mas et fem. In larvis *tortricis* gregarius, Junio mense

evolat. Metamorphosin subit inter folia a Tortrice consuta in folliculis albis bombacinis aggregatis reticulo communi obductis."

Sp. 58. *M. Intercus*.

Schrank. Ins. Aust. 764. "*Ichneumon Intercus: minutus niger abdomine ovato depresso basi testaceo.* (Long. 2 lin.; antenn. $\frac{2}{3}$; alar. ant. 1; aculei $\frac{1}{3}$.) Simillimus priori sed abdominis basi et tibiis rufis."

Sp. 59. *M. gregarius*.

Schrank. Ins. Aust. 766. "*Ichneumon gregarius: niger pedibus abdominisque lateribus ferrugineis.* (Long. $1\frac{1}{2}$ lin.; alar. anticar. $1\frac{1}{2}$; antenn. $1\frac{2}{3}$.) Antennæ nigræ articulis plurimis minutis: caput nigrum lingua flava: pedes ferruginei: abdomen nigrum brevi petiolo thoraci annexum lateribus tamen et subtus basi flavum: alæ incumbentes hyalinæ anticæ macula marginali nigra.—*Hab.* in larvis *Papilionum* gregarius. Exeuntes proprios folliculos singuli aggregatos nent; sed folliculus albus non flavus."

Discrimen ab *M. glomerato* quod ex anni tempore Auctor duxit, nos falsum esse comperimus; hic etenim sæpius hyemem in folliculis durat vere proditurus; quod Réaumurius jam docuerat.

Sp. 60. *M. alvearifex*.

Schrank. Ins. Aust. 767. "*Ichneumon alvearifex: niger petiolatus pedibus ferrugineis, abdomine subtus basi decolore.*—*Hab.* in folliculis albis in modum alvearis dispositis."

Laudat autem ad hanc auctor *Ichneumonem* Geoffroy, II. p. 322, qui a Fabricio ad *Ichm. alvearium* adhibetur.

Sp. 61. *M. tibialis*.

Curt. E. B. 321. No. 9. "*Microgaster tibialis: niger pedibus ochraceis, femoribus posterioribus et tarsis piceis, alis subfuscis.*"

Sp. 62. *M. atrator*.

Curt. ibid. No. 13. "*Microgaster atrator: niger tibiis et tarsis ochreis, posticis fuscescentibus.*"

Sp. 63. *M. Anomalon*.

Curt. E. B. 321. No. 15. "*Microgaster anomalon: niger corpore brevissimo compresso, femoribus anticis apice et tibiis ochreis.*"

Hic et proxime præcedentes ad sectionem B. pertinent.

Sp. 64. *Microgaster* ——— ?

Ray. Ins. 255. No. 13. "*Vespa Ichneumon parva Erucigena nullis in cauda setis, corpore antennis et pedibus nigris. Ad marginem exteriorem alarum notæ nigræ et vix conspicuæ sunt. Hæc viridis cujusdam erucæ lineolis albicantibus notatæ præcociis alumna est. Vermiculi hujus generis productrices omnes unam quamprimum ex erucæ corpore erepserunt nidum sibi texunt e lana tenuissima alba, rotundum seu globosum nucis Avellanæ magnitudine.*"

Sp. 65. *Microgaster* ——— ?

Réaum. II. Mem. 11. p. 424. T. 35. F. 2. Ex erucis *Phalenæ Aristolochiam, Urticam et Peucedanum depastis* larvæ prodierunt. Hæ folliculos in globum communem bombacinum contexere.

Sp. 66. *Microgaster* ——— ?

Réaum. II. Mem. 11. p. 424. T. 35. F. 5, 6. E globis similibus in culmis graminum vulgatissimis prodierunt *Ichneumones* minutissimi antennis longis, abdomine ferrugineo tenuissimè petiolato.

Sp. 67. *Microgaster* ——— ?

Réaum. II. Mem. 11. p. 432. T. 33. F. 17. Larvæ hujus paulo majores quam *M. alvearii*, ex erucâ quercus folia depastâ prodierunt et ibidem folliculos albos in folio irregulariter aggregatos absque reticulo communi contexere.

Sp. 68. *Microgaster* ——— ?

Réaum. ibid. F. 14, 15. Larvæ hujus magnitudine intermediæ inter larvas præcedentis et *M. alvearii*, folliculos albos sericeos in folio graminis absque ordine aggregatos contexere.

Sp. 69. *Microgaster* ——— ?

Loudon. Mag. Nat. Hist. V. p. 768. *Microgaster glomeratus*; prodiit e larvis *Phalenæ grossulariatae*.

Sp. 70. *Microgaster* ———?

Loudon. Mag. Nat. Hist. V. p. 109. *Microgaster glomeratus*; prodierunt e larvis *Phalenæ* *Cajæ*. D^{nus}. Newman. D^{nus}. Westwood verò autumatur hunc diversum fore a *M. glomerato* vero (*ibid.* p. 301); quod verisimile videtur.

Sp. 71. *Microgaster* ———?

Merian. Ins. I. 22. Ex eruca (*Tortricis*?) *Rosæ* victitante prodierunt quinque larvæ. Folliculos harum albos eruca contexebat, die 14^{ma}. prodierunt *Ichneumones* parvi.

Sp. 72. *Microgaster* ———?

Merian. Ins. II. 41. Ex eruca *Vanesse Atalantæ*. Folliculi aggregati reticulo communi obtecti. *Ichneumones* nigri.

Sp. 73. *Microgaster* ———?

Merian. Ins. II. Ex eruca (*Noctuæ* ut videtur) viridi lineis tribus flavis maculisque nigricantibus ornata in foliis alni inventâ prodierunt larvæ quamplurimæ; harum folliculos aggregatos ut *M. glomerati* tabula exhibet. *Ichneumones* parvi nigri.

Sp. 74. *Microgaster* ———?

Merian. Ins. III. 15. Ex eruca *Cynthiæ Cardui* prorupere larvæ quamplurimæ. Folliculos harum eruca contexebat in unum, reticulo gossipium referente. *Ichneumones* nigri, quorum aculeum abdominis longitudine tabula exhibet.

Sp. 75. *Microgaster*? ———?

Merian. Ins. II. 38. Ex eruca (*Tortricis*) viridi, capite flavo, urticæ folia convolvante prodierunt larvæ quamplurimæ. Folliculi harum sparsim positi. *Ichneumones* parvi nigricantes.

Sp. 76. *Microgaster*? ———?

Merian. Ins. II. 30. Ex eruca flava alni foliis enutrita proruperunt tres larvulæ quæ mox folliculos albicantes seorsim contexebant *Ichneumones* hinc enati flavi sunt pedibus concoloribus, capite nigro.

A. H. HALIDAY.

3, North Cumberland-street, Dublin,
May 23, 1834.

ART. XXII.—*Notes on Names.*—By E. N. D.

 JULIET.—What's in a name?

EVERY language consists of two classes of words; those which have been so long naturalized, as to be considered native; and those which have been so lately introduced, or are of such outlandish sound, that we at once detect their extraction, and which mix as well with our every-day discourse as a black sheep with white. Surely no one will hesitate to acknowledge, that in every language the native words are spoken with the greater ease, and heard with the greater pleasure. The English language consists of words of one, two, and three syllables. From the Greek and Latin we obtain others of four, five, and even six syllables; but it is a very small portion of these that ever thoroughly lose the traces of their extraction, or trip from an English tongue with perfect ease and smoothness. You must have found how much easier it is to *praise* than *eulogise*, much less *panegyrise*, an author. The opposites of these terms I will not quote as examples; because your pen, ever flowing with the cream of human kindness, refuses to acknowledge them. In their native languages, on the contrary, high-sounding polysyllables are not only appropriate, but beautiful. I recollect, with pleasure, the many occasions in which you have delighted me with examples of this;—when the stored-up treasures of by-gone ages have overflowed in a tumult of quotation;—yet were your veneration for the ancients to induce you to transplant their sounding compounds into your native tongue, your discourse or writings would become encumbered and displeasing. On account of this paucity of polysyllables our language has been charged with poverty;—a charge from which our poets, in my opinion, fully exempt it: it is indeed simple, but has a sweetness and purity which often approach to an exceeding beauty.

Now I admit, that our technical names should be derived entirely from the dead languages; but if we expect them to be introduced in common parlance in a modern tongue, should we not pay some little respect to the character of that tongue? Names which we wish to see becoming familiar household words, should they not be adapted in some degree to our usual

mode of speaking? I have heard it gravely contended, that number of syllables and grandeur of sound gave importance to names;—alas, they simply proclaim the bad taste of the name-giver! Let me recommend to my fellow-travellers in this, the most humble path of the science, to limit their new names to as few syllables as possible; two will be found, in general, amply sufficient; three, however, may be considered perfectly allowable; and on rare occasions, when the name is minutely descriptive, four may be pardoned: but, in all instances, the name should be so compounded, that a child of seven years old, with an ordinary education, might read it with perfect ease.

Long, harsh, and ill-compounded names, are generally to be imputed to want of taste. There is, however, another frequent fault in the naming of species, which I attribute solely to poverty of resource. I refer to the practice of giving to an insect the name of its captor, with one or two i's appended by way of making a genitive:—thus we have Davis-*i*, Hope-*i*, and Waterhouse-*i*, the nominatives being Davis-*us*, Hope-*us*, and Waterhouse-*us*. Hundreds of names have lately been given in this elegant manner. This way of latinizing names is not, however, confined entirely to entomologists; as the letters W. R., standing for Williamus Rex, in divers and sundry places, abundantly testify.

A third complaint I have to make, is, that of taking the name of a species after it has been in use for years, and applying it to a genus or family, giving, at the same time, a new name to the species. This practice invariably creates confusion.

A fourth, and common fault in nomenclature, is that of giving to a species a name of distinct meaning, yet affording no possibility of our applying such meaning. I consider objectionable, on this ground, all names denoting size, as *major*, *medius*, *minor*, *minimus*, *minutus*, *minutissimus*; all names denoting a frequency of occurrence, as *communis*, *vulgaris*, *vulgatus*, *vulgatissimus*; all names denoting similarity, as *similis*, *assimilis*, *confinis*, *cognatus*, *congener*; all names denoting the plants on which insects are accidentally found, as *quercus*, *salicis*, *lapathi*. As instances of the faultiness of these, we have in one genus a *minor* larger than a *major*; in another, a *minutissimus* larger than a *minutus*; a *vulgatissimus*, of excessive rarity; a *quercus*, that feeds on every tree

except the *oak*; and many other departures from truth equally absurd.

As general rules, liable to but few exceptions, I would say, a generic name should be of Greek derivation, and descriptive of a character not possessed by neighbouring genera; that a specific name should be a Latin adjective decidedly descriptive of character, not possessed by neighbouring species, or a proper name derived from the Heathen Mythology, and conveying no idea excepting in connexion with some fable, which may perhaps serve to assist our memory; and that generic and specific names should be very easily pronounced or read, and should not exceed three syllables in length.

ART. XXIII.—*Observations on the British Species of Pipunculidæ.* By FRANCIS WALKER, F. L. S.

THESE insects were first noticed by Latreille, in his *Hist. Nat. Insect. and Gen. Crust. et Insect.*, where he placed them at the end of the *Syrphidæ*, followed by the *Conopidæ*; remarking, however, that their situation is doubtful, and that they have the external appearance of the *Sargidæ*. Fallen also placed them with the *Syrphidæ*, and designated them by the characteristic name *Cephalops*. Meigen first allowed them the distinction of a family (*Megacephali*), which he placed between the *Platypezidæ* and the *Dolichopidæ*. In the first edition of the *Règne Animal*, Latreille observed that they have some resemblance to the *Stratiomydæ*, and especially to *Scenopinus*, but that the third joint of their antennæ is not annulated. In the second edition of this work he has partly followed Meigen's arrangement, by uniting *Callomyia*, *Platypeza*, *Pipunculus*, and *Scenopinus* into a family (*Cephalopsides*), placed between the *Dolichopidæ* and the *Tabanidæ*.

Family.—PIPUNCULIDÆ.

Musca . . . *Bosc.*

Pipunculus. *Latreille, Meigen, St. Fargeau and Serville, Haliday.*

Microcera . *Meigen.*

Cephalops . *Fallen.*

Corpus parvum, lineare aut sublineare: caput magnum, thorace latius, ferè hemisphæricum: oculi maximi, caput ferè totum occupantes: ocelli 3 mediocres, approximati, supra verticem trigonè dispositi: antennæ 4-articulatæ, parvæ, capite breviores; articulus 1^{us}. minimus; 2^{us}. mediocris, cyathiformis; 3^{us}. longior, latus, compressus; 4^{us}. setiformis, 3ⁱ. basi proximus: hypostoma angustum: os parvum, occultum; labium breve; maxipalpi longi, apice crassiores; mandibulæ brevissimæ: thorax convexus, longior quàm latus: prothorax minimus, supra vix conspicuus: mesothoracis scutum maximum, nonnunquam indistincte bilineatum; scutellum mediocre, semicirculum fingens: *maris* abdomen segmentis 6, thorace multò longius, plerumque sublineare, apice obtusum; segmenta 5 aut 6 subtus conspicua: *fem.* abdomen segmentis 7; apicale parvum, subtus abdomen recurvum, oviductu corneo acuminato terminatum: pedes breves, subæquales, spinis nigris brevissimis instructis armati; coxæ mediocres; femora subincrassata; tibiæ quasi contortæ, paullò arcuatæ, subclavatæ; tarsi lati; articulus 1^{us}. longus; 2^{us}. brevis; 3^{us}. et 4^{us}. brevissimi; 5^{us}. 2^o. paullò longior; ungues longi, graciles: alæ incumbentes parallelæ, plerumque angustæ et corpore longiores, pilis vix conspicuis densè vestitæ; nervus costalis pilosus, paullò ultra alæ apicem productus: nervus secundarius et nervus auxiliaris basi conjuncti, hic ultra, ille paullò ante costæ medium nervum costalem attingentes: nervus 2^{us}. et 3^{us}. nervo auxiliari orti, basi conjuncti, hic multò ante, ille prope alæ apicem nervum costalem attingentes: nervus 4^{us}. aut perfectus, aut valdè abbreviatus; nervus 5^{us}. alæ marginem posticum attingens; nervi 2 breves, incompleti, unus alæ basi, alter nervo 5^o. emissus et nonnunquam obsoletus: nervulus transversus medius brevissimus: cellulæ costales et basales longæ, angustæ; marginales magnæ, irregulares, apicem versus plerumque latiores: halteres et squamæ parva.

In form they are very peculiar, and have but little resemblance to the other families of *Diptera*. They are nearest allied to the *Syrphites*, particularly to *Paragus* and *Sphegina*, but the structure of the mouth is more simple, and somewhat resembling that of *Scenopinus*, the *Platypezidæ*, and the *Muscites*. Like the *Syrphites*, they fly well, and are often seen hovering in the air, but they walk slowly, and have feet more adapted for climbing than for running. They slightly resemble the *Platypezidæ* externally, but have no affinity to the *Muscites*. The species may be found from spring to

autumn, in woods, and on the grass beneath trees. Their economy is unknown. The females have a curved and rather long ovipositor, apparently adapted to pierce the substances where they deposit their eggs. I have made a new genus of Meigen's third division, which differs very much from the first and second; however, the form and clothing of some of the latter species indicate an approach to it: *e.g.* *P. campestris* and others are distinguished by their cylindrical abdomens, which in *P. modestus* and *P. ruralis* are flat, and, in the females of the latter, pilose. They are pilose and flat in both sexes of *P. auctus* and of Meigen's third division.

GENUS I.—PIPUNCULUS, Latreille.

Pipunculus. (A. et B.) Meigen.

Corpus plerumque breve: *maris* oculi supra connecti: antennæ articulo 3°. apice curvo acuminato: metathorax mediocris: abdomen subarcuatum; *mari* segmento 1°. brevi; 2°. 3°. et 4°. subæqualibus; 5°. longiore; 6°. parvo; *fem.* segmentis 1°. ad 6^{um}. subæqualibus: pulvilli magni: alæ iridescentes; nervus 3^{us}. undulatus; nervus 4^{us}. perfectus, undulatus, angulum ad nervum transversum ordinarium formans et nervi costalis apicem attingens; nervi 2 incompleti apice conjuncti; nervulus transversus ordinarius subarcuatus.

Obs.—*Maris* hypostoma angustius; antennæ articulo 3°. brevior et obtusior; tarsi angustiores; ungues et pulvilli parviores; alæ longiores et plerumque obscuriores.¹

* *Nervus* 4^{us} *longitudinalis simplex*.

† *Abdomen cylindricum, basi paullo angustius*.

‡ *Alæ immaculatæ*.

Sp. 1. Pip. maculatus. Mas et Fem. *Æneo-ater, abdomine maculis rufis* (Mas) *aut fascia interrupta flava, (Fem.) pedibus flavis, alis fuscis*.

Æneo-ater, nitens, pubescens: caput atrum, anticè utrinque et subtus argenteo micans: oculi ocellique rufi: os flavum: antennæ fuscae; articulus 3^{us}. argenteo micans; 4^{us}. niger: thorax glaber; anticè utrinque flavo tuberculatus: abdomen basi utrinque pilis albis vestitum; *mari* segmentis 2°. ad 4^{um}. apice utrinque rufis;

¹ First observed by Mr. Haliday.

5°. et 6°. nigris scabris obscuris ; *fem.* segmento 2°. apice utrinque flavo, 3°. et 4°. flavis supra nigro vittatis : oviductus flavus : pedes flavi ; femora basi nigro maculata ; tarsi articulo 5°. supra plus minusve fusco ; ungues flavi, apice fuscis ; pulvilli pallidè flavi : *maris* alæ obscurè fuscæ ; nervi nigri, basi fulvi : *fem.* alæ subfuscæ ; nervi fuscis ; costa nigra ; squamulæ flavæ ; squamæ et halteres straminea, hi basi fulvi. (Corp. long. $1\frac{1}{2}$ — $1\frac{3}{4}$ lin. ; alar. $2\frac{3}{4}$ — $3\frac{1}{2}$ lin.)

Var. β.—*Mas*, meso- et rarius metafemora omninò flava.

July ; on furze and heath ; near London.

Note.—The male of this species resembles *P. rufipes* of Meigen, but he says that the abdomen and thighs are black ; the tips only of the latter red : in this species they are yellow, with only a small, and sometimes obsolete, black spot near the base.

Sp. 2. Pip. sylvaticus. *Mas* et *Fem.* *Nigroviridis, pedibus nigris, genubus tarsisque flavis, alis fuscis.*

Pipunculus sylvaticus. *Meigen, Dipt. Europ. IV. 20. 3.*

Nigroviridis, nitens, glaber : caput anticè utrinque et subtus argenteo micans : oculi ocellique rufi : os rufum : antennæ nigræ ; articulus 3^{us}. fuscus, argenteo micans : thorax anticè utrinque stramineo tuberculatus ; scutellum non prominens : abdomen pubescens, basi utrinque pilis nigris vestitum, *maris* angustius ; segmentum 1^{um}. griseum : oviductus flavus : pedes nigri ; femora apice, tibiæ basi et tarsi subtus flava ; tarsi supra fulvi, articulus 5^{us}. fuscus ; ungues et pulvilli flavi, illi apice fuscis : *maris* alæ obscurè fuscæ, *fem.* fuscæ ; nervi et squamulæ nigro-fusca, illi basi pallidiores : squamæ flavæ ; halteres straminei. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin. ; alar. 2— $2\frac{1}{4}$ lin.)

July ; on grass beneath trees ; near London. June ; New Forest, Hampshire.

Note.—Meigen says that the tibiæ are fuscous, with yellow tips.

Sp. 3. Pip. geniculatus. *Mas.* *Ater, pedibus nigris, genubus flavis, alis subfuscis.*

Pipunculus geniculatus. *Meigen, Dipt. Europ. IV. 20. 2.*

Ater, nitens, glaber : caput anticè utrinque et subtus argenteo micans : oculi ocellique rufi : antennæ nigræ ; articulus 3^{us}.

argenteo micans : thorax anticè utrinque fusco tuberculatus ; scutellum non prominens : abdomen breve, latum, vix pubescens, basi utrinque pilis nonnullis albis vestitum, apice angustius : pedes nigri ; tibiæ basi, genua, pulvilli et ungues flava ; hi apice fusci : alæ subfuscæ, breves, corpore vix longiores ; nervi nigri, basi fusci : squamulæ fuscæ ; squamæ et halteres straminea. (Corp. long. $1\frac{1}{2}$ lin. ; alar. 2 lin.)

May ; on grass beneath trees ; near London.

†† *Alæ sub costa inter nervum secundarium et nervum auxiliarem fusco maculatæ.*

Sp. 4. Pip. flavipes. Fem. *Ater, pedibus flavis fusco fasciatis, alis subfuscis latis.*

Pipunculus flavipes. *Meigen, Dipt. Europ. IV. 21. 5.*

Ater, nitens, glaber : caput anticè subtus et utrinque argenteo micans : oculi ocellique rufi : antennæ fuscæ, articulus 3^{us}. flavescens, argenteo micans : thorax anticè utrinque fusco tuberculatus ; scutellum non prominens : oviductus flavus : pedes obscure flavi ; coxæ nigræ, apice flavæ ; pro- et mesofemora fusco, metafemora nigro interruptè fasciata ; tarsi articulo 5^o. fusco ; ungues et pulvilli flavi, illi apice fusci : alæ subfuscæ ; nervi nigro-fusci, basi pallidiores ; squamulæ et squamæ flavæ ; halteres pallide flavi, basi obscuri. (Corp. long. $1\frac{1}{2}$ lin. ; alar. $2\frac{1}{2}$ lin.)

October ; on grass beneath trees ; near London.

Note.—According to Meigen's description, the legs are entirely yellow.

Sp. 5. Pip. pratorum. Mas et Fem. *Griseus, pedibus flavis, fusco nigroque cingulatis, alis fuscis.*

Cephalops pratorum. *Fallen, Dipt. Succ. Syrph. 15. 1.*

Pipunculus pratorum. *Meigen, Dipt. Europ. IV. 22. 7.*

Griseus, obscurus : caput utrinque, anticè et subtus argenteo micans : oculi ocellique rufi : antennæ nigræ ; articulus 3^{us}. nigro-fuscus, argenteo micans : thorax posticè et utrinque argenteus, anticè utrinque fusco tuberculatus ; scutellum vix prominens : oviductus flavus : pedes flavi ; coxæ basi nigræ ; femora nigra, apice basique flava ; tibiæ fusco ferè cingulatæ ; tarsi articulo 5^o. fusco, fem. pallidiore ; ungues et pulvilli flavi, ille apice fusci : *maris* alæ fuscæ ; nervi nigri, basi fusci ; squa-

mulæ fuscæ; squamæ flavæ; halteres fusci, basi pallidiores: fem. alæ subfuscæ; nervi basi et squamulæ flava; halteres flavi, basi fulvi. (Corp. long. $1\frac{2}{3}$ lin.; alar. $2\frac{3}{4}$ —3 lin.)

May to July; on grass beneath trees; near London.

Sp. 6. Pip. campestris. *Griseus*, maris abdomine atro, pedibus nigris, alis fuscis, mas; aut hyalinis, fem.

Musca cephalotes . . . *Bosc. Journ. d'Hist. Nat.* I. 53. Pl. 20. No. 5.

Pipunculus campestris. *Latr. Hist. Nat. des Crust. et des Insect.* XIV. 392; *Gen. Crust. et Insect.* IV. 332; *Meig. Dipt. Europ.* IV. 19. 1; *Leach, Edin. Encycl.* X. 130.

Mas.—Fuscus, obscurus, pubescens: caput nigrum, argenteo micans: oculi ocellique rufi: antennæ nigrae; articulus 3^{us}. argenteo micans: thorax apice, utrinque et subtus nigro-nitens; scutellum non prominens: abdomen atrum, holosericeum, basi utrinque pilis nonnullis sordidè albis vestitum: segmentum 1^{um}. griseo circumdatum; sequentia apice nigro-ænea, nitentia: pedes nigri, nitidi; trochanteres nigro-fusci; tibiæ basi et genua fulva; tarsi nigro-fusci, subtus pallidiores, articulus 5^{us}. niger; ungues et pulvilli flavi, illi apice fusci: alæ fuscæ; nervi nigri, basi fusci; squamulæ et squamæ fuscæ; halteres obscurè rufi, basi fusci.

Fem.—Nitens: thorax griseo-ater: abdomen pubescens: oviductus flavus: trochanteres et tibiæ fusca; femora apice, tibiæ basi et genua flava; tarsi fusci, basi et subtus flavi: alæ hyalinæ; nervi basi flavescents; halteres et squamæ flava, illi basi fusci. (Corp. long. $1\frac{1}{4}$ — $1\frac{3}{4}$ lin.; alar. $2\frac{1}{2}$ — $4\frac{1}{2}$ lin.)

Var. β.—*Fem.* propedes tibiis tarsisque pallidè fuscis; meso- et metapedes tibiis tarsisque nigro-fuscis.

May to July; on grass beneath trees; near London. June; Windsor; New Forest, Hampshire.

†† Abdomen planum. Alæ maculatæ.

Sp. 7. Pip. modestus. Mas et Fem. *Ater*, griseo maculatus, pedibus nigris fusco flavoque cingulatis, alis fuscis, mas; aut subhyalinis, fem.

Pipunculus modestus. *Haliday, Ent. Mag.* I. 162.

Mas.—Ater, opacus, lævis : caput anticè, utrinque et subtus argenteo micans : oculi ocellique rufi : antennæ nigræ : thorax anticè utrinque fusco tuberculatus ; latera et apex grisea : abdomen elongato-ovatum, pubescens ; latera grisea et basi pilis nonnullis nigris vestita : pedes nigri ; trochanteres fusci ; genua et tibiæ basi flava ; tibiæ nigro-fuscae ; tarsi fusci, basi et subtus fulvi, articulus 5^{us}. nigro-fuscus ; ungues et pulvilli pallidè flavi, illi apice fusci : alæ fuscae ; squamulæ fuscae ; nervi nigri, basi fusci ; squamæ flavæ ; halteres fusci.

Fem.—Nigro-æneus, pubescens : thorax anticè utrinque fulvo tuberculatus ; thoracis latera et apex, necnon abdominis maculæ laterales albo-grisea : oviductus niger, apice flavus : tarsi fusci ; articulus 5^{us}. niger : alæ subfuscae ; halteres fusci. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin. ; alar. 2 — $2\frac{2}{3}$ lin.)

Var. β.—*Mas*, tibiæ nigræ ; meso- et metatarsi nigro-fusci, basi fusci.

Var. γ.—*Mas*, tarsi fulvi, apice fusci.

Var. δ.—*Fem*. tarsi basi et subtus fulvi.

May and June ; on grass beneath trees ; near London.

Sp. 8. *Pip. ruralis*. *Mas* et *Fem*. *Fuscus, abdomine griseo maculato, pedibus nigris fusco flavoque cingulatis, alis subfuscis*.

Pipunculus ruralis. *Meigen, Dipt. Europ.* IV. 22. 8.

Mas.—Fuscus, pubescens : caput argenteo micans : oculi ocellique rufi : antennæ nigræ ; articulus 3^{us}. apice argenteus : thorax anticè utrinque fusco tuberculatus ; latera et apex grisea : abdomen utrinque ad segmentorum apices griseo trigonè maculatum : pedes nigri ; genua et tibiæ basi flava, hæ subtus nigro-fuscae ; tarsi fusci, subtus rufofusci, articulus 5^{us}. nigro-fuscus ; ungues et pulvilli flavi, illi apice fusci : alæ subfuscae ; squamulæ fuscae ; nervi nigri, basi fusci ; squamæ flavæ ; halteres fusci, medio albi.

Fem.—Pilosus : scutellum prominentius, apice setosum : abdomen basi utrinque pilis albis vestitum ; maculæ medio connectæ : oviductus flavus : tibiæ fuscae, basi flavæ ; tarsi pallidè fusci, basi et subtus flavi : alæ subhyalinæ ; nervi basi flavescentes ; halteres pallidè rufi, basi fusci. (Corp. long. $1\frac{1}{2}$ — $1\frac{3}{4}$ lin. ; alar. $3\frac{1}{4}$ — $3\frac{1}{2}$ lin.)

May to July; on grass beneath trees; near London.
June; Windsor forest; New Forest.

** *Nervus* 4^{us}. *longitudinalis ramulum brevem emittens.*

Sp. 9. Pip. auctus. Mas et Fem. *Ater*, mas; *aut fuscus*, fem; *griseo maculatus*, *pedibus nigris fusco cingulatis*, *alis hyalinis*.

Cephalops auctus. *Fallen, Dipt. Suec. Syrph.* 61. 1. 2.
Pipunculus auctus. *Meigen, Dipt. Europ.* IV. 23. 10.

Mas.—*Ater*, obscurus, pilosus: caput argenteo micans: oculi ocellique rufi: antennæ nigræ; articulus 3^{us}. argenteo micans: scutellum prominens: abdomen planum, apice angustius, subtus nigro-griseum; segmenta apice utrinque grisea: pedes nigro-grisei, pilosi; genua flava; tibiæ nigro-fuscæ, apice basique fuscæ; tarsi fuscii, subtus fulvi; ungues et pulvilli albi, illi apice fuscii: alæ hyalinæ; squamulæ nigro-fuscæ; nervi-nigri, basi fuscii; squamæ et halteres fusca.

Fem.—Fuscus, pilosus: abdomen apice paullo angustius: thorax utrinque et apice abdominisque segmenta apice grisea: oviductus niger, nitidus, apice rufus: squamulæ fuscæ: squamæ et halteres rufa. (Corp. long. $1\frac{1}{2}$ — $1\frac{2}{3}$ lin.; alar. $2\frac{5}{4}$ —3 lin.)

July; on grass beneath trees; near London. May;
Birchwood, Kent. June; Windsor. New Lanark, Scotland.

GENUS II.—CHALARUS.* *Walker.*

Maris oculi supra non connecti: antennarum articulus 3^{us} ovatus, 2°. non multò longior: *maris* et *fem.* ungues et pulvilli similes, mediocres: alarum nervus longitudinalis 3^{us}. ferè rectus; 4^{us}. apice, nervulus transversus ordinarius nervusque basalis incompletus omninò obsoleti.

Sp. 1. Cha. spurius. Mas et Fem. *Ater*, obscurus, *pedibus nigris*, *alis fuscis*.

Cephalops spurius. *Fallen, Dipt. Suec. Syrph.* 16. 3.
Pipunculus spurius. *Meigen, Dipt. Europ.* IV. 24. 11.

Mas.—*Ater*, holosericeus, obscurus, pilosus: oculi ocellique rufi: antennæ nigræ: thorax anticè utrinque nigro-fuscus: scutellum prominens, metathoracem obtegens: abdomen depressum, apice angustius; segmenta subæqualia: pedes atrii, pilosi; tarsi subtus

* Χαλάρος, languidus.

nigro-fusci; unguis nigri; pulvilli fusci: alæ obscurè fuscae; nervi nigri; macula sub costam inter nervos secundarium et auxiliarem elongata, brunnea; squamulae, squamae et halteres nigro-fuscae.

Fem.—Sparsè pilosus: abdomen nigro-fuscum: oviductus fuscus: tarsi nigro-fusci: alæ fuscae; squamæ et halteres pallidè fuscae. (Corp. long. $1-1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}-2\frac{1}{4}$ lin.)

May to July; on grass beneath trees; near London.

Sp. 2. Cha. holosericeus. Mas et Fem. *Niger, pedibus nigro-fuscis flavo cingulatis, alis subfuscis.*

Pipunculus holosericeus. *Meigen, Dipt. Europ.* IV. 24. 12.

Pipunculus exiguus . . . *Haliday, Ent. Mag.* I. 162.

Mas.—Niger, obscurus, vix pilosus: oculi ocellique rufi: antennæ nigrae: thorax anticè utrinque nigro-fuscus: abdomen nigro-fuscum, pilis albis sparsè vestitum: pedes nigro-fusci, vix pilosi; genua, tibiæ apice et basi tarsisque fuscae, propedum flava; unguis et pulvilli flavi, illi apice fusci: alæ fuscae; nervi nigri, basi fusci; squamulae nigro-fuscae; squamae et halteres fuscae.

Fem.—Oviductus fuscus: pedes flavi; coxæ fuscae; femora fusca, apice basique flava; protibiæ flavo, meso- et metatibiæ fusco cingulatae: alæ subfuscae; squamæ et halteres flava. (Corp. long. 1 lin.; alar. $1\frac{1}{2}$ lin.)

August; on grass beneath trees; near London.

ART. XXIV.—*The Honey Bee.* By EDWARD BEVAN, M. D.
London: Baldwin & Cradock.

GENTLE Bee! bright example to mankind of industry, economy, concord, and obedience! what triumphs, what wonders, dost thou not achieve! It shall be our delightful task to talk of thee, and to write of thee; and if we talk not, and write not, pleasantly, then indeed the fault is in ourselves, and not in thee. Sweet is the sound of thy morning hum, attuned to music, when thou revelest on some gay bank of purple heather, visiting bell after bell in quest of their ambrosial essence, heaven-distilled! Sweet is the air around thee, air impreg-

nated with the breath of flowers! Sweet is the joyous concert of feathered choristers above and about thee! Sweet is the memory of those few happy days when we have drank freely of scenes like these, and basked in the early sunshine on some fragrant bed of thyme, "dazzled and drunk with beauty"—the beauty of nature.

Gentle reader! has thy soul never sympathized with nature—has it never been so deeply steeped in the love of nature as to have assumed, for a passing moment, her rosy hue? Young love lends a light to woods and fields that is not all their own—we have felt it, but feel it no longer.

Oh! the days are gone when beauty bright
Our heart's-chain wove,
When our dream of life, from morn to night,
Was love—still love.

The "milder, calmer" days are now come, and we love nature for her own sake; our delight in her is perhaps a little diminished in intensity since objects have ceased to reflect the glowing tints of our thoughts, but there is a soberer, purer, more enduring beauty in the colours which are truly her own, and the soul now receives at her hands those hues which, in earlier life, it had the power to impart. Love invests objects with a joyous dancing splendour that is not real, as the glare of a noon-day sun gives a quivering motion to the white stones in a churchyard, while, in reality, they partake of all the deathly quiet of those whose tale they tell.

Gentle reader! we will now give thee a few directions about thy bees; and these, not thrown together at random, but the result of much observation and experience. Select the site for thy colony with care; let not the wide and rapid river roll by it, nor the pool stagnate near it; these are often sources of great loss of life to bees, especially in windy weather; yet a gently murmuring brook, bubbling, in all its transparent purity, over flattened pebbles, may harmlessly meander through thy clovery meadows, or even through thy garden, stored, as it must be, with honey-distilling flowers. Let a high wall or a close hedge protect thy colony from the biting north-wind, yet take care that it be not placed so as to hide the hives from thy view as thou art sitting in thy parlour, for thine eye should be continually upon thy treasure, taking instant cognizance of any thing that is amiss. Let each hive be placed on a stand,

at least eighteen inches from the ground, and four feet from each other. Let the hives stand quite clear from the wall or hedge, so that thou mayest approach them readily from behind. Let no tree or house overshadow or drip on them. And lastly, let no offensive smell or harsh noise trouble their quiet, for they enjoy quiet, and ease, and comfort. Gentle reader! listen while we repeat to thee an ode in commendation of these things.

Quiet—he prays for on the vast Ægean,
When by black storm-clouds the fair moon is hidden,
And the bright stars, those certain guides to seamen,
Cease from their shining.

Quiet—the Thracian, furious in warfare :
Quiet—the Mede, so graceful with his quiver :
Grosphus—with jewels, purple, nor with riches
Can it be paid for.

For neither treasures nor the consul's lictor
Can move the spirit's miserable tumult,
Nor yet the troubles that so often flutter
Round gilded ceilings.

He may live well with little, whose paternal
Salt-cellar shines upon his slender table ;
Terror nor filthy avarice can mar his
Peaceful slumbers.

Why so short-lived then plan we many projects ?
Why do we seek for regions that are heated
By other sunshine ? Who his country's exile
Self too can fly from ?

Care inauspicious climbs the brass-clad vessel :
Never abandons multitudes of horsemen :
Swifter than stags are, and impelling rain-clouds ;
Swifter than Eurus.

Spirits at present joyful, for the future
Hate to be thoughtful ; and the bitter sweeten,
Mirthful with smiling ; nothing is on all sides
Doomed to be happy.

Sudden the death of heroic Achilles :
Lingering old age wore away Tithonus :
And to me the hour, that to thee's forbidden,
Perhaps may be lengthened.

Hundreds of cattle, and of cows Sicilian,
Low all around thee ; mares, too, raise their neighings,
Yoked to thy chariot ; and in Afric's murex
Doubly empurpled

Mantles enfold thee ; me a little cottage,
And a slight spirit of the Grecian muses,
Fate, not deceitful, gave ; and the malignant
Vulgar to pity.

Gentle reader ! that is a long digression, certainly, but thou wilt pardon us, for it is from the pen of Rusticus, and thou art ever indulgent when he is addressing thee : he will soon be again amongst us, and then he will take the “ Log ” in his own hands, for we found we could not manage it so as to do him justice. Now we return to the bees, and nothing shall again induce us to wander. Select, if possible, a country that abounds in lime-trees, furze, heath, clover, and thyme ; let the bowers in thy garden be entwined and overshadowed with honeysuckle and jasmine ; and cultivate, in abundance, borage, and vipers'-bugloss, and mignonette, and sage.

A bee-hive consists, like this highly-favoured nation, of three estates, king, lords, and commons. The king of a bee-hive is, however, always a *queen* ; here, only sometimes. The lords are useless, except as perpetuators of the kind, and are called *drones* ; at the end of the season, instead of being allowed to riot on the riches of the commonwealth during the winter, they are all put to death in the most summary manner. The commons are called *worker bees* or *neuters*.

The Queen is slow and majestic in her movements, and differs from the workers in being larger, having a longer body, shorter wings, and a curved sting ; she is accompanied by a guard of twelve workers, who are always on duty. In whatever direction she wishes to travel, these guards clear the way before her, always with the utmost courtesy, turning their faces towards her, and when she rests from her labours, approaching her in all humility, licking her face, mouth, and eyes, and fondling her with their antennæ. The principal engagement of the queen is the laying of eggs : she may be called the mother as well as queen of the hive.

The Drones are all males ; they are less than the queen, but larger than the workers ; they have no sting. The drones live on the fat of the land, and are wholly without use as members of the community, except as being the fathers of the future progeny : when this sole office is accomplished, the workers inform them very respectfully that they are no longer wanted ; a buzzing and a bustle commences in the hive ; the workers

and the drones sally forth together, grapple each other in the air, hug and scuffle for a minute, during which the poisonous dagger of the workers is plunged into the side of the drones, who bow down their heads, gather their legs together, and gracefully drawing their wings as a gauzy mantle around them, hide their face from observation, and so die.

The Workers are the smallest bees in the hive, and by far the most numerous; they have a longer lower lip for sucking honey than either of the others; their thighs are furnished with a brush for the reception of the farina of flowers; and their sting is straight. The workers do the entire work of the community; they build the cells, guard the hive and the queen, collect and store the honey, elaborate wax, feed the young, and kill the drones. The respective number of individuals in a full hive are thus: 1 queen, 2,000 drones, 20,000 workers.

The queen lays her eggs one in the bottom of each cell; the egg is long, slightly curved, and of a bluish colour; when laid it is covered with a glutinous matter, which enables it to adhere to the bottom of the cell. For eleven months the queen lays only workers' eggs; after that those which produce drones. As soon as this change has taken place the workers begin to construct royal cells, in which, without discontinuing laying the drones' eggs, she deposits now and then, about once in three days, an egg which is destined to produce a queen. The workers' eggs hatch in a few days, and become little white maggots, which immediately open their mouths to be fed: this the workers attend to with the utmost assiduity. In six days the maggot fills up its cell; it is then roofed in by the workers, spins a silken cocoon, and becomes a chrysalis, and on the twenty-first day it comes forth a perfect bee. The drones emerge on the twenty-fifth day, and the queens on the sixteenth.

As we have already stated, the queen for nearly a year lays no eggs that are destined to produce queens; it therefore follows, that if, during that period, any evil befall her, the hive is left without a queen: sometimes she dies; sometimes she wanders too near the mouth of the hive, falls out, and a bird devours her; sometimes she is taken away by the experimenting apiarian for the express purpose of watching the result. For twelve hours little notice is taken of the loss; it appears not to be known, and the workers labour as usual. After that period

a hubbub commences; work is abandoned; the whole hive is in an uproar; the nation has lost its sovereign, and feels the loss deeply; every bee traverses the hive at random, with the most evident want of purpose. This state of anarchy sometimes continues for days; then the bees gather in knots, clusters of a dozen or so, as though engaged in consultation; shortly after a resolution seems to have been made; a few of the workers go to work at the cells in which are the eggs of workers; three of these cells are quickly broken into one, the edges polished, and the sides smoothed and rounded; a single egg being allowed to remain at the bottom. When this egg hatches, the maggot it produces is fed with a peculiarly nutritive food, called royal bee bread, which is never given to any maggots but such as are to produce queens. Work is now resumed over the whole hive, and goes on as briskly as before. On the sixteenth day the worker's egg produces a queen, whose appearance is hailed with every demonstration of delight, and who at once assumes sovereignty over the hive.

Gentle reader! in the course of thy earthly pilgrimage thou wilt meet with many things that may seem at the first glance rather unaccountable, and this is perhaps one of those things; but a calm inquiry will relieve our statement of all impossibility, at least: let us endeavour to explain it. There are, as we have set forth, three kinds of bees in a hive; but there are only two sexes, male and female. Drones are the males; queens and workers are the females, the workers being for the most part abortive. That the workers are females is amply proved by their possessing a sting, and various other anatomical similarities, besides the circumstance of their occasionally laying eggs; and therefore, in the wonderful instance before us, the change is to be attributed solely to the difference of food and care bestowed on the maggot by the workers.

Let us pause an instant, and look at this fact in another light; let us recollect that, if each maggot were supplied with a sufficiency of food, and that food sufficiently nutritious, then every female would be a queen. How then would the labour of the hive proceed? there would be no cells, no honey stored for the winter, and the whole community would consequently perish. It is as remarkable, indeed it is more remarkable, that so large a proportion should thus be stinted in their growth, purposely that they might never be encumbered with the cares

of maternity, but their whole attention fixed on other matters, than that a maggot well supplied with wholesome nutriment should arrive at that perfect development which is the characteristic of its sex.

When, under ordinary circumstances, a young queen emerges from the chrysalis, the old one frequently leaves the hive, heading the first swarm for the season, and, flying to some neighbouring resting-place, is observed by the apiator, captured, placed under a new hive, and a new colony is immediately commenced. Before a swarm leaves the hive, sure indications are given of the intended movement; the workers leave their various occupations, and collect in groups, especially near the door of the hive, as though in consultation on the important event about to take place.

As the summer advances many queens are hatched, but the workers do not allow them instant liberty, as severe battles would instantly take place between them and the reigning queen, in which one would be killed. The workers, therefore, merely make a small hole in the ceiling of the royal cell, through which the captive queen thrusts her tongue, and receives supplies of food from the attentive workers. In this state of confinement the queens utter a low querulous sound, which has been compared to singing. When the reigning, or any other queen that has gained her liberty, finds one of these captives, she uses every effort to tear open the cell and destroy her rival. To prevent this the workers often interpose, pulling her away by the legs and wings. To this she submits but a short time, when, uttering a peculiar cry, called her voice of sovereignty, she commands instant attention and obedience, and is at once freed from her assailants.

We must not extend our remarks; we fear some of our readers will think we have already done so beyond the bounds of etiquette to our contributors, many of whom have become weary with long waiting. At a future time we may again use the title of Dr. Bevan's book as an excuse for writing about Bees; for the present we content ourselves with recommending it to our readers.

ART. XXV.—*Entomological Captures at Mickleham and Neighbourhood.* By JOHN WALTON.

SIR,—I have now before me a numerous catalogue of insects captured, in the summer and autumn of 1832 and 1833, in the vicinity of the delightful village of Mickleham, situated in a narrow valley between the chalky ridges near Box-hill, Surrey. From this catalogue I have selected such as are stated to be rare or local, adding a few observations on their localities, &c., which, if you deem worthy to be published, are much at your service.

I.—LEPIDOTERA.

Colias Electra
Leucophasia sinapis
Nemeobius Lucina
Melitæa Euphrosyne
Argynnis Aglaia
Paphia
Vanessa Polychloros
Cynthia cardui
Hipparchia Semele
Galathea
Thecla rubi
Polyommatus Alsus
Corydon
Adonis
Argus
Agestis
Thymeles Alveolus
Tages
Pamphila comma

Xylophasia lithoxylea
sublustris
epomidion
Hadena plebeia
capsincola
Heliophobus popularis
Hama aliena
Apamea nictitans
furca
Scotophila porphyrea
Miselia compta
Polia advena
fineta
serena
Lucania rufescens
Cucullia Verbasci
umbratica
lucifuga
Stilbia anomalata
Ophiusa lusoria
Euclidia glyphica

Hypena proboscidalis
obesalis
Polypon nemoralis
Ennychia anguinahs
Pyrausta purpuralis
porphyrialis
Hydrocampa nymphaea
Diaphania lucernalis
Margaritia pallealis
flavialis
Lozotænia oporana
fulvana
Orthotania undulana
Pæcilochroma Udmanniana
Xanthosetia Zegana
Hamana
Oncocera carnella
Crambus argentellus
Pterophorus didactylus

IV.—COLEOPTERA.

Ino statices
Sphinx ligustri
Deilephila porcellus
Dasychira pudibunda
Euthemonia russula
Nemophila plantaginis
Spilosoma menthastri
Callimorpha jacobææ
Lithosia helvola
griseola
Gnophria rubricollis
Setina irrorella
Triphaena orbona
Cerigo texta
Lycea umbrosa
Agrotis corticea
segetum
Graphiphora brunnea
punicea
C. nigrum
plecta
Mythimna grisea
Caradrina Morpheus
glareosa
Pyrophila Tragopogonis

Bupalus Piniarius
Crocallis elinguaris
Campæa margaritata
Hemithea vernaria
Cleora lichenaria
Alcis repandata
Aspilates gilvaria
Larentia bipunctaria
Harpalyce fulvata
ocellata
unangulata
Polyphasia immanata
Steganolophia prunata
Anaitis plagiata
Xerene procellata
rubiginata
Phibalapteryx tersata
Triphosa dubitata
Eupithecia nebulata
Centaureata
Emmelesia rivulata
Strenia clathrata
Ptychopoda lividata
ornata
Macaria liturata
Drepana unguicula

Lamprias nigritarsis
cynocephalus
Tarus angularis
macularis
Brachinus erepitanus
Cychrus rostratus
Leistus spinibarbis
Badister bipustulatus
microcephalus
Licinus silphoides
depressus
Odontonyx rotundicollis
Amara ærata
lata
Bradytus discrepans
marginatus
apricarius
Harpalus thoracicus
ignavus
Ophonus azureus
punctatissimus
puncticollis
cribellum
Atopa cervina
Chrysomela hyperici
Callidium violaceum.

REMARKS. — *Nemeobius Lucina*, *Thecla rubi*, *Polyommatus Argus*, *Caradrina glareosa*, *Stilbia anomalata*,

Ophiusa lusoria.—On the east side of Sir Henry Leslie's park, adjoining the Beechwood.

Polyommatus Corydon, *P. Adonis*, *Pamphila comma*.—All very plentiful on the south side of Juniper-hill and in Norbury-park.

Hipparchia Galathea, *Polyommatus Alsus*, *Setina irrorella*, *Aspilates gilvaria*, *Ptychopoda ornata*, *Margaritia flavalis*.—On the first chalky bank, at the end of a wood on the left, in a lane leading from Juniper-hill to Headley, about a quarter of a mile from the principal road to Dorking.

Deilephila porcellus, *Agrotis corticea*, *Xylophasia sublustris*, *Polia advena*, *P. tincta*.—Captured from the flowers of the *Lychnis dioica* and *Silene inflata*, with forceps, in fields intersected by a foot-path leading from behind the church, through a fir plantation, to Juniper-hill.

Cerigo textu, *Lytea umbrosa*, *Heliophobus Popularis*.—Banks of the river Mole; in fields opposite a beech-wood, divided by the river.

Lithosia helvola.—Very plentiful on the west side of Box-hill.

Callidium violaceum.—Crawling on the gravel-walks, and in the house, of a cottage-villa adjoining Mr. Haynes' timber-yard.

Tarus angularis, *T. macularis*, *Lamprias nigratarsis*, *Badister microcephalus*, *Licinus silphoides*, *L. depressus*, *Bradytus marginatus*, *Harpalus thoracicus*, *H. ignavus*, *Ophonus azureus*.—Under flints, on the south-side of Box-hill, facing Dorking; *Licinus depressus* is in greater abundance on the same continuous bank, more easterly, near a large fir plantation, under flints on the grass eaten bare by sheep, which it seems to prefer to more sterile situations. I obtained upwards of three hundred specimens, frequently found in pairs (*in copulâ*), from the middle of September until the latter end of October. *Licinus silphoides* is more plentiful about a mile west of Mr. Denison's house, in every field on the same chalky ridge, which runs on to Guildford. In one stubble field I found thirty-five specimens in a few hours, under large pieces of chalk and flint. Unlike its congener, it seems to prefer situations more or less free from grass, to expedite its running after its prey, or otherwise. It is by far the commonest beetle in that neighbourhood, and not periodical in its times

of appearance. I have captured upwards of five hundred specimens in two successive years; and it is surprising that an insect so common, and to be found in so many habitats near London, should have been so rare, a few years back, as to be estimated to be worth a guinea a pair: I apprehend they are now at a discount, for I cannot get rid of my duplicates. *Tarus macularis* appears to be a mere variety of the *T. angularis*: the result of a comparison by entomologists of nearly one hundred specimens, captured in two successive autumns, seems to strengthen this opinion. It is plentiful in October, under flints, on the southern slope of Box-hill, opposite the town of Dorking. Every year's experience seems to confirm the opinion of Mr. Stephens, so often mentioned in his invaluable Illustrations, that insects which are stated to be rare or local are generally very plentiful in some of their localities: for example; I well recollect the difficulty I had, and the days which I lost in Norbury-park, in procuring a single pair of the *Lithosia helvola*, and the pleasure I felt when I at last succeeded; when, to my utter astonishment, about two miles from the same place, upon the west side of Box-hill, during twilight, I found this very rare insect in the greatest profusion. On the wing it performs its graceful undulations about the tops of yew-trees, particularly in warm, still evenings: this is a nearer habitat than the New Forest. Perhaps some persons will be surprised at my having described, as nearly as possible, the localities of the preceding insects, as well as those captured on yew-trees, (Vol. II. page 207.) I have not followed the system, so much in vogue, of disguising or of giving such vague and indefinite descriptions, as to render it impossible for any one to find them; on the contrary, I have copied from the botanist, and imitated the example of some entomologists, particularly Mr. Newman, in describing or directing the foot-step of every lover of nature to the locality of that beautiful insect, the *Chrysomela cerealis*, in the first number of the Magazine. I am quite aware of the difficulty, or utter impossibility, of accurately describing the habitats of some insects, on account of their extreme locality; but this does not excuse the attempt to misguide, or justify an entire suppression of the information. We have proof enough that the pages of the Magazine are impartially open to every humble labourer in the field of science; and is not the industry

of these necessary to assist the more scientific in completing the great fabric of the system of nature, and in giving accuracy and uniformity to its nomenclature?

Where insects are plentiful, the naturalist, I imagine, will experience less difficulty in ascertaining their habits and economy; but how is this interesting knowledge to be acquired if we continue to disguise their habitats? On the contrary, by publishing them we diffuse a more intimate knowledge of our indigenous productions, we give our brother entomologists the power of enriching their own cabinets, and we increase their enjoyments in the anticipation of the pleasure of supplying their friends with *desiderata*. Will it not have a tendency to surpress or discourage that dealing spirit, and all its degrading accompaniments? to shame and expose that petty, sordid selfishness of exulting in public or in private, like the miserable miser over his useless gold, in being the possessor of a series of insects of which others have not a specimen? Persons who do this are, in my opinion, ignorant in the extreme, and *totally insensible to the best pleasures of science*. "The happy influence of the study of nature is only felt by a few, giving more ardour to sentiment, more elevation to the thoughts, and more benevolence to the disposition."

I am, Sir,

Your obedient servant,

JOHN WALTON.

Byard's Lodge, Knaresbro', Yorkshire,

June 3, 1834.

ART. XXVI.—*Thoughts on the Geographical Distribution of Insects*.—By DELTA.

(Continued from p. 54.)

THE Entomologist, who feels interested in studying those laws which regulate the distribution of genera and species over the surface of the earth, will carefully observe, as far as he is able, the mean annual temperature, the mean summer and mean winter temperature, the elevation, the latitude and longitude, of the places where he may collect. He will remember, that it is not the *mean annual* temperature alone that influences

the production of any region, that these are influenced as much by the mean temperature of the coldest and hottest months; that often, countries, possessing the same mean annual temperature, differ surprisingly in their mean summer and mean winter temperatures; that, as we approach the equator, the temperature of elevated districts will become more and more uniform throughout the year, and less resemble that of the low grounds of higher latitudes, where the mean temperature is the same. Nor should he omit to observe the nature of the soil, the humidity or dryness of the atmosphere, and the generally clear or cloudy state of the sky, which so much influences vegetation.

In speaking of the generally cloudy state of the sky, I allude more particularly to parts where, as on the coast of Peru, or in the neighbourhood of Turbaco, in Colombia, the sky is almost always covered with a sort of haze, which of course diminishes much the effect of the sun's rays. It would be highly interesting to observe carefully the insects of parts situated under such a sky, because thence we might be enabled to form many interesting conjectures as to the effect of light upon their colouring. Without doubt the greater intensity of light in the equatorial regions adds to its richness and brilliancy. M. Boisduval informs us that *Urania Rhiphaeus*, if disclosed from the pupa in the shade, never attains its full beauty, the colouring always being fainter than when the wings are expanded in the sun.

Latreille, in his "Introduction à la Géographie Générale des Arachnides et des Insectes," observes, "Je crois pouvoir assurer que l'augmentation de la lumière tend à convertir le jaune en rouge ou en orangé, et que sa deperdition fait passer ce jaune au blanc. Ce fait s'applique aussi à des coquilles. *L'Helix nemoralis*, ou la livrée, qui dans nos climats a le fond jaune est rouge ou rougeâtre en Espagne: dès qu'en allant du nord au midi l'on arrive à l'Ile de Ténériffe, l'on s'aperçoit déjà que notre papillon du chou (*Papilio Cheiranthi*, Hübn.) et celui qu'on nomme le *Vulcain* (*Atalanta*) ont éprouvé une modification dans leurs couleurs." This may all be perfectly true, but there follows a sentence which, I must confess, a little staggers me; and if M. Latreille brings forward the fact there stated to support his theory, that the diminution of light "fait passer ce jaune au blanc," nothing could be more unfortunate,

for it goes entirely against it. “*Les papillons diurnes de nos montagnes ont ordinairement le fond des ailes blanc ou d'un brun plus ou moins foncé.*” It really is most astonishing that this admirable entomologist should have so entirely forgotten himself; he must, had he given it a moment's consideration, have remembered that the intensity of light is much greater on elevated ground, and that, owing to this very cause, the vine is cultivated upon these mountains at an elevation which corresponds, in mean temperature, to that of the plains four degrees farther north than the extreme point at which, in the plains, it prospers by the effect of the mean temperature alone. “If the spaces, through which light passes in a uniformly dense diaphanous medium, increase in arithmetical progression, the quantity will decrease in geometrical progression.” Hence we can readily conceive how much more intense the light must be on high mountains than in vallies, to reach which it has to pass through some thousand feet of air, not uniformly, but increasingly, dense, and, moreover, often humid. I should attribute the changes to which he alludes more to the influence of temperature than to that of light, yet we cannot doubt that this last has some influence, for the diurnal *Lepidoptera* gain much more in brilliancy than do the nocturnal.

It is much to be regretted that naturalists, who visit foreign climes, which afford most excellent opportunities for physiological inquiries of this kind, mostly neglect them altogether, contenting themselves with merely collecting new species, to be described under barbarous half-Greek half-Latin names, by some fireside naturalist. Oh for another Humboldt! one who would do for entomology what he has done for botany. But, alas! such men are rare, and seem only given us

Ut in hoc infelici campo
 Ubi luctus regnat, et pavor,
 Mortalibus prorsus non absit solatium,
 Hujus enim scripta evolvas
 Mentemque tantarum rerum capacem
 Corpori caduco superstitem credas.

And now, to show my admiration of this great man, I am going again to extract a passage from his “*Tableaux de la Nature.*” “The prodigious elevation, in the tropical regions, not of isolated mountains alone, but also of entire countries, and

the cool temperature of this elevation, procure to the inhabitants of the torrid zone an extraordinary spectacle. Besides groups of palms and bananas, they have around them forms of vegetables which seem to belong only to the regions of the north. Cyresses, firs, and oaks, barberries and alders, nearly resembling our own, cover the mountains of the south of Mexico, as well as the chain of the Andes, under the equator. In these regions, nature has enabled man to behold, without quitting his native land, all the forms of vegetables spread over the face of the earth, and the vault of heaven, which displays itself from pole to pole, with all its glittering worlds. These natural enjoyments, and an infinity of others, are wanting to the inhabitants of the north. Many constellations and many forms of vegetables, especially the most beautiful, those of the palms, the plantains, the arborescent *gramineæ*, and the *mimosæ*, with their fine pinnated foliage, remain for ever unknown to them. The languishing individuals contained in our hot-houses can give but a feeble idea of the majesty of tropical vegetation. But the perfection of our language, the burning inspiration of our poets, and the imitative art of our painters, open to us an abundant source of recompense. Our imagination may hence draw living images of exotic nature. In the rigorous climate of the north, in the midst of the desert heath, man, though solitary, can appropriate to himself all that has been discovered in the most distant regions, and thus create within himself a world, which, the offspring of his genius, is, like that, imperishable."

In countries which offer so great a variety of elevation and of temperature, an entomologist may sometimes wish to ascertain, within a little, the temperature and elevation of a spot when unprovided with the necessary instruments. Here he can call in botany to his aid. The different forms of plants alluded to in the above extract will enable him to form a tolerable estimate of the mean temperature. The abundance of the *Palmæ*, *Musaceæ*, and other plants confined to the hotter regions, of course will show that the elevation is but small, whilst the oaks, or *Cinchonæ*, will point out to him that he has reached that happy elevation where all fear of the dreadful disorders of the lowlands is at an end; where the air breathes nothing but health:—

Where a leaf never dies on the still blooming bowers,
 And the bee banquets on through a whole year of flowers ;
 Where only to feel that we breathe, that we live,
 Is worth the best joys that life elsewhere can give.

But merely to judge by the general aspect of vegetation would be by far too vague, and there is a means of arriving at much more satisfactory conclusions. Nature has assigned to all plants certain limits which they cannot pass ;—they are limited in their range by temperature, elevation, and also as to latitude and longitude ;—and though the agency of man may carry them beyond these latter limits, yet no art can cause them to flourish without that degree of heat which is necessary to their development. The olive, the peach, and other fruits carried from Europe to the high plains of the Andes, never there ripen their fruit, although they attain a greater growth than even in their native country. The cause of this is, that they require a much higher temperature during one portion of the year (namely, the period of the growth and ripening of their fruit), than is to be found in these elevated regions. The temperature of these regions resembles more that of our spring months, only less changeable ; and hence, perhaps, we may be allowed to conjecture that their insects would be analogous to the vernal ones of the neighbouring countries nearer the poles. Now, if we know—and Humboldt has told us—the temperature required by those plants most commonly cultivated, we can, from the presence of two or more of these, deduce very nearly not only the mean annual temperature, but also the extremes of temperature. I say *two or more*, because any one may extend over a very considerable range as to climate, but by observing two or more, and comparing their limits, we may arrive at very precise ideas on these points. Let us suppose ourselves to be not more than ten degrees on either side of the line,—

Where the slumbering earthquake
 Lies pillowed on fire,
 And the lakes of bitumen
 Rise boilingly higher ;—
 Where the roots of the Andes
 Strike deep in the earth,
 As their summits to heaven
 Shoot soaringly forth.

Suppose, that when unprovided with instruments, or without sufficient time to make use of them, we wish to ascertain the temperature of some one of the plains on the sides of these colossal mountains,—

Whose heads in wintry grandeur tower,
And whiten with eternal sleet;
While Summer, in a veil of flowers,
Is sleeping rosy at their feet.

Let us look around us. The breeze plays wantonly through the dense dark-green foliage of the cacao, and the silky leaves of the banana, whilst the tree-ferns wave gracefully above thick groves of *Cinchonæ* and arborescent *Melastomæ*. The coffee flourishes, exposed to full radiance of the sun. There are no rows of plantains or of *Erythrinæ*, whose scarlet blossoms are frequented by humming-birds, to shelter it from its too great power. The presence of the cacao indicates a mean heat between 84° and 74° Fah., whilst that of the *Cinchonæ* indicates a much cooler temperature than the former of these. This shows us that we are near the limit,—as one ceases, the other begins to thrive. The coffee-shrub will only flourish without shelter from the sun where the mean temperature does not exceed 75° Fah. Comparing this with the limits of the cacao, we arrive at the conclusion, that the temperature is either 74° or 75° Fah.; and knowing this, and the latitude, we can easily deduce the elevation.

In plants, we find equinoctial forms extending much farther south of the equator than north of it; and this also appears to be the case in insects. Latreille states, that Trinidad is the extreme northern limit of *Morpho Menelaus* and other equinoctial insects, whilst these are well known to be far from rare at Rio, in lat. 20° 59' south; and, if I mistake not, Spix and Martius state, that they occur at an elevation of 2,000 or 3,000 feet on the *campos* in that latitude.

Although we may lay it down as a rule, that the insects of two countries enjoying the same temperature, but widely differing in latitude and longitude, will be totally different, yet we shall find a certain resemblance between them,—a kind of representation of one another,—which will be more strong in proportion as the soil and general outline of the two countries resemble one another. Thus we find the extraordinary South-

African genus *Manticora*, represented on the plains of New Mexico by a cognate genus, *Omus*; and on the sandy plains of Chili, the insects much resemble those of Africa, a very considerable portion of the *Coleoptera* being heteromerous. I am indebted for this information to my kind friend Mr. Walker, who also informs me that many insects from the extreme southern part of America nearly resemble our own. This is exactly what we should be led to infer from the nature of the climate, which may be called insular with as much propriety as that of our own country.

And now, reader, farewell! I doubt not that thou hast found many an error in this paper, and hast often exclaimed—

“Tramite quo tendis majoraque viribus audes,”

or something of that sort. These I trust that thou wilt pardon; and I promise that I will not often, in this way at least, intrude upon thee again; perhaps never, unless those visions should be realized which have been to me “like the vapour of the plains, which the thirsty traveller thinketh to be water, but when he cometh to it he findeth nothing.”

Vale!

Δ.

ART. XXVII.—*Monographia Chalciditum*. By FRANCIS WALKER.

(Continued from p. 179.)

“—— the green myriads in the peopled grass.”

Family, PTEROMALIDÆ.

Corpus plerumque metallicolor aut nigrum: caput et thorax pubescentia, quasi squamea, nunquam aut rarissimè colore pallido variegata: caput breve, transversum, thoracis latitudine, *vari* sæpè magnum thorace latius: oculi mediocres, laterales: ocelli 3, supra verticem trigonè dispositi: os occultum: mandibulæ parvæ:

palpi plerumque simplices, *marī* rarissimè dilatati aut fissi: antennæ articulis 13, nonnunquam 12, rarissimè 11, *marī* plerumque filiformes corporis longitudine, *fem.* plerumque clavatæ corpore breviores, simplices, plus minusve pubescentes; articuli approximati, sublineares; 1^{us}. longus; 2^{us}. cyathiformis; clava triarticulata: thorax varius: mesothorax plerumque ejus ferè totum occupans: abdomen sessile, quasi subtilissimè squameum, supra planum, *maris* rotundum lineare aut spathuliforme, *fem.* ovatum sublineare aut basi latum inde ad apicem gradatim acuminatum: oviductus carinula ventrali receptus, nonnunquam subexertus et vaginis duabus lateralibus reconditus: pedes mediocres, sub-æquales, pubescentes; coxæ parvæ; tibiæ rectæ, apice spinis armatæ, *marī* nonnunquam dilatatæ; tarsi graciles, articuli 1^o. ad 4^{um}, longitudine decrescentes; 5^{us}. 4^o. longior; ungues et pulvilli parvi: alæ plerumque amplæ, pubescentes, iridescentes; proalæ nervo unico solito, cujus humeralis ulnari longior, radialis sat longa stigmatē terminata; metalæ nervo unico simplici, costæ medium attingente.

Metamorphosin in *Lepidopterorum*, aut rariùs *Muscidum* et *Tenthredinidum*, pupis subeunt; nonnullæ ad *Cleonymum* propinquæ *Coleoptera* lignivora (*Anobium Hylurgum* et *Hylesinum*) diruunt. *Mares* sæpè colore læto abdomineque flavo maculato gaudent; *feminæ* obscuriores, abdomine rarissimè maculato. Characteres quibus *Chalciditum* tarsis 5 articulatis familiæ discrepant breviter memorabo. *Spalangiidum* caput planum; *Eurytomidum* corpus gibbosum aut cylindricum; *Chalcididum* et *Leucopsidum* meta-femora incrassata; *Torymidum* et *Perilampidum* nervus cubitalis brevissimus; *Miscogasteridum* abdomen petiolatum; *Ormoceridum* antennæ moniliformes; *Pteromalidum* abdomen sessile et planum; *Cleonymidum* thoracis structura propria; *Eupelmidum* et *Encyrtidum* mesotarsi dilatati; *Aphelinidum* antennæ articulis paucis.

The genus *Pteromalus* was named and characterized by Swederus in the Stockholm Transactions, where fifteen species are described, which, with the exception of two or three, have been since removed to other genera. His first species, *P. puparum*, is very abundant, and has been often described by entomologists: from one to two hundred specimens of it are found in a single chrysalis of the common white or tortoiseshell butterfly (*Pontia Brassicæ* and *Vanessa Urticæ*). It is often difficult to identify the species of this family, for the males and females generally differ entirely in form and colour, and, like the *Ichneumonites*, the latter are either the most numerous

in individuals, or are oftener met with, being constantly engaged in search of chrysalises wherein to deposit their eggs. They comprise by far the greater part of the pentamerous *Chalcidites*. The parts of the mouth do not vary much. Generally the *prothorax* and the *metathorax* are very small, and the sutures between the *parapsides* and the *scutum* of the *mesothorax* indistinct. The first and last divisions depart from this structure; the first resembles many of the *Miscogasteridæ* and *Ormoceridæ*, the last is allied to the *Cleonymidæ*.

The principal divisions are the following:—

- * *Prothorax brevissimus, transversus.*
- † *Mesothoracis parapsides scuto discretæ.*
- †† *Mesothoracis parapsides scuto ferè in unum confusæ.*
 - ‡ *Antennæ 11-articulatæ.*
 - ‡‡ *Antennæ 12-articulatæ.*
 - ‡‡‡ *Antennæ 13-articulatæ.*
- × *Antennæ articulo 3^o. vix conspicuo, 4^o. minimo, 5^o. parvo.*
- ×× *Antennæ articulo 3^o. et 4^o. minimis, 5^o. mediocri.*
- ** *Prothorax productus, anticæ angustus.*

-
- * *Prothorax brevissimus, transversus.*
 - † *Mesothoracis parapsides scuto discretæ.*
- | | | | | |
|---------|---|---|---|---|
| Antennæ | { | 13-articulatæ
12-articulatæ. Thorax punctis ma-
joribus | { | I. Seladerma.
aspersus . . II. Semiotus.
non aspersus. III. Systasis. |
|---------|---|---|---|---|

GENUS I. SELADERMA,^a Walker.

Fem.—Caput mediocre, thorace vix latius: mandibulæ elongato-subquadratæ, paullò arcuatæ, tridentatæ, similes; dens externus et medius acuminati; internus latus, obtusus: maxillæ elongatæ, subarcuatæ, ciliatæ, quæque internè apicem versus in lobum producta; palpi sat longi, 4-articulati, subfiliformes; articulus 1^{us}. mediocris; 2^{us}. paullò longior; 3^{us}. 1^o. æqualis; 4^{us}. 2^o. longior fusiformis: mentum elongato-ovatum, basi emarginatum: labium breve, latum, apice ciliatum; palpi 3-articulati, breves; articulus 1^{us}. mediocris; 2^{us}. brevis; 3^{us}. 1^o. paullò longior crassus acumi-

^a Σέλας splendor, δερμα cutis.

natus: antennæ corporis dimidio æquales aut paullò longiores, subclavatæ, pubescentes; articulus 1^{us}. gracilis, filiformis; 2^{us}. mediocris; 3^{us}. et 4^{us}. minimi; 5^{us}. et sequentes ad 10^{um}. gradatim breviores et latiores; clava ovata, articulis 9^o. et 10^o. paullò longior et latior: thorax ovatus, quasi planè squameus; prothorax minimus, supra vix conspicuus; parapsides convexæ scuto valdè distinctæ, scutellum conicum, paraptera et epimera benè determinata; metathorax mediocris: abdomen ovatum aut elongato-ovatum, ferè læve, subtus angulatum; segmentum 1^{um}. magnum; sequentia breviora, subæqualia: oviductus occultus: femora et tibiæ gracilia: alæ amplæ; nervus cubitalis ferè alæ apicem attingens; stigma ramulum brevissimum, nonnunquam ferè obsoletum emittens.

Sp. 1. Sel. lætum. Fem. *Viride, antennis nigris, pedibus rufis, femoribus fuscis, alis subfuscis.*

Viride, nitens, sparsè pubescens: oculi ocellique rufi: antennæ nigræ, corporis dimidio longiores; articulus 1^{us}. obscurè rufus, apice niger: thoracis segmentorum margines nonnunquam æneo-virides: abdomen nonnunquam cyaneo- aut æneo-viride, subtus valdè angulatum: pedes obscurè rufi; coxæ virides; trochanteres et femora fusca, hæ apice basique rufa; tarsi apice, ungues et pulvilli fusci; protarsi pallidè fusci: alæ subfuscae; squamulæ fuscae; nervi nigro-fusci; stigma parvum; metalarum nervi pallidiores. (Corp. long. $1\frac{1}{3}$ — $1\frac{3}{4}$ lin.; alar. $2\frac{1}{2}$ —3 lin.)

Var. β .—Minus: thoracis segmenta nonnulla cyaneo-viridia: abdomen viridi-cyaneum: femora, trochanteres et protarsi rufa, illa supra fusco vittata.—Species distincta.?

July; on grass beneath trees; near London.

Sp. 2. Sel. bicolor. Fem. *Viride, abdomine cupreo, antennis nigris, pedibus rufis, alis subfuscis.*

Viride, nitens, sparsè pubescens: oculi ocellique rufi: antennæ nigræ, corporis dimidio non longiores; articulus 1^{us}. rufus; 2^{us}. obscurè fuscus: thoracis segmentorum margines nonnulli æneo-virides: abdomen cupreum, *S. læto* brevius et convexius, subtus valdè angulatum; segmentum 1^{um}. lætè viride, apice cupreum: pedes lætè rufi; coxæ virides; ungues et pulvilli fusci: alæ subfuscae; squamulæ et nervi fusca; stigma parvum; metalarum nervi pallidiores. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. $2\frac{1}{2}$ — $2\frac{1}{2}$ lin.)

June, July; on grass beneath trees; near London.

Sp. 3. Sel. convexum. Fem. *Cyaneo-viride, antennis nigris, pedibus fuscis, femoribus viridibus, alis subhyalinis.*

Cyaneo-viride, nitens, sparsè pubescens: caput viride: oculi ocellique rufi: antennæ nigræ, corporis dimidio vix longiores; articulus 1^{us}. viridis: mesothoracis parapsides et scutum anticè purpurea: abdomen cyaneo-viride, subtus valde angulatum, eodem longitudine quod *S. bicolor*; discus æneo-viridis; segmentum 1^{um}. purpureo-cyaneum: pedes fuscii; coxæ et femora viridia, hæ apice basique rufa; tibiæ basi et subtus, metatibiæ ferè totæ, rufæ; meso- et metatarsi rufo-fuscii, apice fuscii: alæ subhyalinæ; squamulæ et nervi fusca; stigma mediocri; metalarum nervi pallidiores. (Corp. long. $1\frac{5}{4}$ lin.; alar. $2\frac{1}{2}$ lin.)

July; on grass beneath trees; near London.

Sp. 4. Sel. breve. Fem. *Aureo-viride, antennis nigris, pedibus rufis, femoribus basi fuscis, alis hyalinis.*

Præcedentibus brevius et latius, lætè aureo-viride, sparsè pubescens: oculi ocellique rufi: antennæ nigræ, corporis dimidio paullò longiores; articulus 1^{us}. viridis: abdomen subtus angulatum: pedes rufi; coxæ virides; femora basi fusca; meso- et metatarsi apice, ungues et pulvilli fuscii: alæ hyalinæ; squamulæ fuscae; nervi nigro-fuscii; stigma mediocri; metalarum nervi pallidiores. (Corp. long. $1\frac{1}{4}$ lin.; alar. $2\frac{1}{2}$ lin.)

July; on grass beneath trees; near London.

GENUS II.—SEMIOTUS,^b Walker.

Corpus pubescens: caput mediocri, thorace vix latius: mandibulæ subquadratae, ferè rectæ, similes, dentibus 3 parvis acutis armatae; dens internus latus: maxillæ elongatae, subarcuatae quæque internè apicem versus in lobum producta; palpi 4-articulati, breves, ad apices gradatim crassiores; articulus 1^{us}. et 2^{us}. mediocres, subæquales; 3^{us}. paullò longior; 4^{us}. 3^o. paullò longior, elongato-ovatus: mentum breve, conicum: labium parvum, quasi fissum; palpi 3-articulati, brevissimi, filiformes; articuli subæquales: antennæ 12-articulatae, *mari* ferè filiformes corporis dimidio longiores, *fem.* plus minusve clavatae corporis dimidii longitudine aut paullò breviores; articulus 1^{us}. gracilis, filiformis; 2^{us}. brevis; 5^{us}. et sequentes ad 9^{um}. lineares longitudine decrescentes; *mari*

^b σημιωτός, signatus.

clava sublinearis, articulis 8°. et 9°. paullò longior et latior; *fem.* clava elongato-ovata, articulis 8°. et 9°. latior et paullò longior: thorax ovatus, quasi planè squameus, punctis majoribus aspersus: prothorax minimus, supra vix conspicuus: mesothorax magnus; parapsides benè determinatæ, scuto distinctæ; paraptera et epimera parva; scutellum apice subacuminatum: metathorax mediocris: *mas* abdomen elongato-ovatum, ferè læve; segmentum 1^{um}. magnum; sequentia breviora, subæqualia: sexualia exerta, abdominis dimidio nonnunquam vix breviora: *fem.* abdomen ovatum, plus minusve elongatum et acuminatum, subtus angulatum, non compressum: pedes graciles; tibiæ simplices: alæ mediocres; nervus radialis cubitali paullò longior, humeralis prope apicem ramulum rejiciens brevissimum sed benè determinatum; stigma ramulum brevissimum nonnunquam ferè obsoletum emittens.

Sp. 1. Sem. mundus. Mas et Fem. *Viridis, pedibus rufis, alis hyalinis.*

Mas.—Viridis: caput posticè æneo-viride: oculi ocellique rufi: antennæ nigræ: abdomen viridi-cupreum, basi et utrinque viride: sexualia nigra, apice fusca: pedes rufi; coxæ virides; femora basi nigra; tarsi pallidè rufi, apice necnon ungues et pulvilli fusci; protarsi pallidè fusci: alæ hyalinæ; squamulæ et nervi pallidè fusca: stigma minimum; metalarum nervi flavi.

Fem.—Antennæ clavatæ, corporis dimidii longitudine; articulus 1^{us}. flavus, apice et supra nigro-fuscus: abdomen nigro-viride, elongato-ovatum, basi cupreo-viride nitentius, subtus angulatum æneum, apice paullò attenuatum: pedes pallidè rufi; coxæ virides; meso- et metatarsi flavi; ungues et pulvilli fusci. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. $1\frac{5}{8}$ —2 lin.

July; on grass beneath trees; near London.

Sp. 2. Sem. clarus. Mas et Fem. *Præcedenti minor, fem. abdomine longiore, alarum nervis obscurioribus.*

Mas.—Viridis: oculi ocellique rufi: antennæ nigræ: abdomen cupreum; latera et apex viridia: sexualia nigra, apice fusca: pedes rufi; coxæ virides; femora basi nigra; meso- et metatarsi flavi; ungues et pulvilli fusci: alæ hyalinæ; nervi et squamulæ fusca; stigma parvum; metalarum nervi pallidi.

Fem.—Antennæ clavatæ, corporis dimidio breviores: abdomen cyaneo-viride, elongato-ovatum, subtus angulatum, apice attenuatum:

femora basi et coxæ viridia; meso- et metatarsi apice fuscī.
(Corp. long. $1-1\frac{1}{2}$ lin.; alar. $1\frac{1}{2}-1\frac{3}{4}$ lin.)

Var. β.—*Mas*, æneo-viridis.

Var. γ.—*Mas*, meso- et metafemora nigra, apice rufa; meso- et metatibiæ apice pallidè fuscae.

June and August; on grass beneath trees; near London.

Sp. 3. Sem. tarsalis. *Mas et Fem. Viridis, pedibus fuscis, tarsis pallidis, alis hyalinis.*

Mas.—*Viridis*: oculi ocellique rufi: antennæ nigrae: abdomen cupreum, basi apice et utrinque viride: sexualia nigra, apice fusca: pedes rufi; coxæ virides; femora basi nigra; metafemora ferè omnino nigra; metatibiæ fuscae, basi rufæ; tarsi straminei, apice necnon ungues et pulvilli fuscī; protarsi pallidè fuscī: alæ hyalinæ; squamulæ et nervi fuscae; stigma parvum; metalarum nervi pallidiores.

Fem.—Antennæ subclavatae, corporis dimidio vix longiores: abdomen viridi-cupreum, elongato-ovatum, apice paulò acuminatum: femora, meso- et metatibiæ rufa, fusco cingulata; meso- et metatarsi flavi, apice fuscī. (Corp. long. $\frac{1}{2}-1$ lin.; alar. $1-1\frac{3}{4}$ lin.)

Var. β.—*Mas*, mesothoracis scutum viridi-æneum.

Var. γ.—*Mas*, pro- et mesotibiæ pallidè fuscae; metatibiæ obscuriores.

Var. δ.—*Mas*, femora omnia nigra, apice rufa; meso- et metatibiæ fuscae.

Var. ε.—*Mas*, metafemora omninò nigra; tibiæ nigro-fuscae; protibiæ fuscae; meso- et metatarsi flavi, apice fuscī.

Var. ζ.—*Mas*, protarsi rufi; meso- et metatarsi flavi.

Var. η.—*Mas*, abdomen purpureo-cupreum: tibiæ nigrae; protibiæ rufæ, fusco cingulatae.

Var. θ.—*Mas*, meso- et metatarsi pallidè fuscī.

July; on grass beneath trees; near London. June; Windsor Forest.

Sp. 4. Sem. Scoticus. *Fem. Æneo-viridis, pedibus rufis, alis subhyalinis.*

Æneo-viridis: caput obscurè viride: oculi ocellique rufi: antennæ nigrae; clava articulo 9°. multò latior: thoracis puncta majora vix conspicua: abdomen viride elongato-ovatum, basi æneo-viride

nitentius, subtus angulatum æneum, apice non attenuatum: pedes rufi; coxæ virides; femora fusco cingulata; ungues et pulvilli fusci: alæ subhyalinæ; nervi et squamulæ pallidè fusca; stigma minimum; metalarum nervi pallidiores. (Corp. long. $1\frac{1}{2}$ lin.; alar. 2 lin.)

New Lanark, Scotland.

Sp. 5. Sem. varians. Mas et Fem. *Viridis, præcedenti brevior, pedibus fuscioribus, alis subfuscis.*

Mas.—Obscurè viridis: oculi ocellique rufi: antennæ nigræ: abdomen nigro-cupreum, basi et utrinque viride: sexualia nigra, apice fusca: pedes fusci; coxæ virides; trochanteres, femora apice, tibiæ basi tarsique flava; tarsi basi et apice, ungues et pulvilli fusci: alæ subfuscae; squamulæ et nervi fusca; stigma parvum; metalarum nervi pallidè fusci.

Fem.—Viridis: antennæ clavatæ: abdomen nigro-viride, elongato-ovatum, basi æneo-viride, subtus angulatum æneum, apice vix attenuatum: pedes pallidè rufi; coxæ virides; femora basi viridia; meso- et metatarsi flavi; ungues et pulvilli fusci. (Corp. long. $\frac{3}{4}$ — $1\frac{1}{4}$ lin.; alar. $1\frac{1}{3}$ —2 lin.)

Var. β.—*Mas*, meso- et metatarsi basi flavi.

Var. γ.—*Mas*, femora nigro-fusca, apice flava; tarsi flavi, apice fusci.

Var. δ.—*Mas*, protibiæ rufæ; tarsi flavi, apice fusci; protarsi pallidè fusci.

Var. ε.—*Fem.* abdomen omninò æneo-viride.

Var. ζ.—*Fem.* protarsi fusci.

Var. η.—*Fem.* thorax viridi-æneus: tarsi omnes pallidè rufi.

Var. θ.—*Fem.* abdomen cupreum, viridi marginatum: antennæ articulo 1^o. basi rufo.

June; on grass beneath trees; near London. July; near Clermont, Auvergne.

Sp. 6. Sem. præstans. Mas et Fem. *Æneo-viridis, pedibus rufis aut flavis, alis subfuscis, S. Scotico clava angustiore S. variante alis latioribus discrepans.*

Mas.—Viridis: oculi ocellique rufi: antennæ nigræ: caput posticè et mesothoracis scutum anticè æneo-viridia: abdomen cupreum, basi et utrinque viride: sexualia nigra, apice fusca: pedes rufi; coxæ virides; femora basi nigra; meso- et metatibiæ et protarsi

pallidè fusca; ungues et pulvilli fusci: alæ subfuscae; nervi et squamulae nigro-fusca; stigma parvum; metalarum nervi pallidi.

Fem.—Antennae clavatae: abdomen viride, ovatum, basi aeneo-viride nitentius, subtus paullò angulatum, apice acuminatum sed vix attenuatum: femora basi viridia; tibiae et protarsi rufa; meso- et metatarsi flavi: pro-alarum nervi fusci. (Corp. long. 1—1½ lin.; alar. 1½—2 lin.)

Var. β.—*Mas*, viridis: abdomen cupreum, basi aeneo-viride: tibiae omnes et protarsi rufa; meso- et metatarsi flavi.

Var. γ.—*Mas*, femora et protarsi fusca, illa apice flava.

Var. δ.—*Mas*, *Var. β.* similis: abdomen aeneum, basi viride nitentius: meso- et metatarsi apice fusci.

Var. ε.—*Mas*, abdominis discus obscurè cupreus: pedes flavi; coxae virides; femora basi nigra; meso- et metatarsi straminei, apice necnon ungues pulvilli et protarsi omninò fusci.

July; on grass beneath trees; near London. June; New Forest, Hampshire.

Sp. 7. Sem. diversus. *Mas* et *Fem. Viridis, pedibus rufis, alis fuscis*, S. variante et præstante *fem. abdomine longiore et angustiore discrepans*.

Mas.—Viridis: oculi ocellique rufi: antennae nigrae, graciles: abdomen basi nitentius: sexualia nigra, apice fusca: pedes rufi; coxae virides; femora basi fusca; meso- et metatarsi apice, ungues et pulvilli fusci: alæ fuscae; squamulae et nervi obscuriora; stigma parvum; metalarum nervi pallidi.

Fem.—Antennae clavatae, corporis dimidio breviores: abdomen aeneo-viride, elongato-ovatum, angustum, subtus paullò angulatum, apice acuminatum et attenuatum: oviductus rufus: pedes rufi; coxae et femora basi viridia; meso- et metatarsi pallidè rufi; ungues et pulvilli fusci. (Corp. long. 1—1⅔ lin.; alar. 1¼—1½ lin.)

Var. β.—*Mas*, femora basi nigra; protarsi pallidè fusci.

Var. γ.—*Fem.* antennae articulo 1º. rufo: femora omninò rufa.

Var. δ.—*Fem.* aeneo-viridis: antennae articulo 1º. fusco: abdomen aeneum.

Var. ε.—*Fem. Var. δ.* similis, viridis: mesothoracis scutellum et metathorax viridi-aenea: abdomen aeneo-viride.

Var. ζ.—*Fem. Var. ε.* similis: abdomen obscurè viride, basi aeneo-viride nitentius: tarsi apice fusci.

June; on grass beneath trees; near London.—Jersey.

Sp. 8. Sem. quadratus. Mas et Fem. *Viridis, pedibus rufis, alis fuscis, specibus 4 præcedentibus alis angustioribus discrepans.*

Mas.—*Viridis*: oculi ocellique rufi: antennæ nigræ: abdomen cupreum, basi viride: sexualia nigra, apice fusca: pedes rufi; coxæ virides; femora nigra, apice rufa; profemora rufa, basi nigra; protarsi pallidè fusci; ungues et pulvilli fusci: alæ fuscae, breves, angustæ; squamulæ et nervi obscuriora; stigma parvum; metalarum nervi pallidi.

Fem.—Antennæ clavatæ, corporis dimidii longitudine; articulus 1^{us}. rufus, apice fuscus: metathorax viridi-æneus: abdomen æneo-viride, ovatum, basi nitentius, subtus angulatum, apice acuminatum non attenuatum: femora et protarsi omninò rufa. (Corp. long. $\frac{5}{4}$ — $1\frac{1}{4}$ lin.; alar. 1 — $1\frac{1}{2}$ lin.)

Var. β.—*Mas*, meso- et metatibiæ supra pallidè fuscae.

Var. γ.—*Fem.* antennæ articulo 1^o. nigro, basi fusco: abdomen viride, basi æneo-viride nitentius: femora basi viridia.

Var. δ.—*Fem.* caput et thorax æneo-viridia; antennæ articulo 1^o. nigro.

Var. ε.—*Fem.* caput et thorax cupreo nitentia: antennæ articulo 1^o. nigro, basi fusco: abdomen apice æneum: meso- et metatibiæ rufo-fuscae.

Var. ζ.—*Fem.* abdomen cupreum, basi æneo-viride nitentius.

Var. η.—*Fem.* thoracis latera et abdomen viridi-ænea.

Var. θ.—*Fem.* viridis: antennæ totæ nigræ, femora basi viridia.

June; on grass beneath trees; near London.

Sp. 9. Sem. mærens. Mas. *Obscurè viridis, pedibus flavis, alis griseis.*

Obscurè viridis, longus, sublinearis: oculi ocellique rufi: antennæ nigræ: sexualia nigra, apice fusca: pedes flavi; coxæ virides; femora basi fusca; ungues et pulvilli fusci: alæ griseæ; squamulæ et nervi obscurè fusca; stigma parvum; metalarum nervi pallidi. (Corp. long. 1 — $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ — $1\frac{3}{4}$ lin.)

Var. β.—Æneo-viridis: femora nigra, apice flava; tibiæ pallidè fuscae.

Var. γ.—Femora nigra; tibiæ fuscae, basi flavæ; tarsi apice fusci.

Var. δ.—Tibiæ nigro-fuscae; protibiæ et protarsi pallidè fusca.

Var. ε.—Pedes rufi; femora basi et coxæ viridia; meso- et meta-

tibiæ nigro-fuscae, basi rufæ; meso- et metatarsi pallidè flavi, apice rufi.

June; on grass; Windsor Forest, New Forest. September; near Linton, North Devon.

GENUS III. SYSTASIS,^c *Walker.*

Corpus crassum, breve: caput mediocre, thoracis latitudine: mandibulæ breves, subquadratæ, similes, dentibus 3 vix acutis armatæ; dens externus et medius parvi, internus minimus: maxillæ elongatæ, subarcuatæ, quæque internè apicem versus in lobum producta; palpi 4-articulati, breves, ad apices gradatim crassiores; articulus 1^{us}. mediocris; 2^{us}. paullò longior; 3^{us}. 1^o. æqualis; 4^{us}. 2^o. paullò longior elongato-ovatus: mentum conicum: labium parvum, quasi fissum; palpi 3-articulati, brevissimi, crassi, subfiliformes; articuli subæquales, 3^{us}. acuminatus: antennæ 12-articulatæ, *mari* subfiliformes, *fem.* clavatæ crassiores, corporis dimidio vix longiores; articulus 1^{us}. linearis, longitudine triens; 2^{us}. mediocris; 5^{us}. et sequentes ad 9^{um}. subæquales; clava elongato-ovata, articulis 8^o. et 9^o. longior et *fem.* latior: thorax convexus, brevis, ovatus: pro- et metathorax minimi, supra vix conspicui: mesothoracis scutum, scutellum, parapsides et paraptera benè determinata: abdomen breve, ovatum aut ferè rotundum, supra planum, *fem.* subtus carinatum et angulatum, *mari* angustius, apice vix acuminatum; segmentum 1^{um}. magnum; sequentia breviora, sub-æqualia: oviductus non exertus: pedes graciles, simplices: alæ latæ, sat longæ; nervus humeralis ulnari longior ramulum rejiciens nullum, cubitalis radiali vix brevior stigmatè rotundo terminatus: metalæ nervo unico simplici solito.

Sp 1. Syst. encyrtoides. Mas et Fem. *Viridis, antennis nigris, pedibus viridibus, tarsis flavis aut fuscis, alis hyalinis, nervo humerali ramulum rejiciente nullum.*

Mas.—Lætè viridis, nitens, quasi minutè squameus: oculi ocellique rufi: antennæ nigræ; articulus 1^{us}. viridis: abdomen ferè læve, basi æneo-viride nitentius: pedes virides; trochanteres nigro-fusci; genua rufa; tarsi flavi, apice fusci; articulus 5^{us}., ungues et pulvilli nigro-fusci; protarsi fusci: alæ hyalinæ; nervi et squamulæ nigro-fusca; stigma parvum; metalarum nervi pallidi.

Fem.—Mesothoracis scutellum cupreo-vittatum: abdomen basi

^c *συστασις, coherentia.*

cupreo-viride; segmenta basi ænea: tarsi flavi; protarsi rufi; omnium articulus 5^{us}. nigro-fuscus. (Corp. long. $\frac{5}{4}$ — $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ —2 lin.)

Var. β.—*Fem.* scutelli vitta vix conspicua: abdomen basi æneo-viride: protarsi fusci.

Var. γ.—*Fem.* thorax cupreo-viridis; segmentorum margines cuprei: tarsi omnes fusci; metatarsi articulo 1^o. basi flavo.

Var. δ.—*Fem.* thorax omninò viridis: abdomen cyaneo-viride, basi viride: profemora apice et protibiæ rufa, hæ supra fusco vittatæ.

Var. ε.—*Fem.* abdomen cupreum, utrinque et subtus viride: protarsi fusci.

Var. ζ.—*Fem.* viridi-cyaneus: caput viride: abdominis discus cupreus: genua et tarsi omnes flava, hi apice fusci.

Var. η.—*Fem.* *Var. ζ.* similis: protibiæ et protarsi fusca: alarum nervi pallidè fusci.

August; on grass beneath trees; near London. September; Isle of White.

Sp. 2. Syst. tenuicornis. Mas et Fem. *Viridis, præcedenti angustior, antennis nigris, pedibus fuscis aut viridibus, alis griseis, nervo humerali ramulum rejiciente brevissimum.*

Mas.—Obscurè viridis, quasi minutè squameus: oculi ocellique rufi: antennæ nigrae; articulus 1^{us}. viridis: abdomen obscurè æneo-viride, angustum, ferè læve: sexualia nigra: pedes nigro-fusci: coxæ et femora viridia; protibiæ et protarsi fusca; meso- et metatarsi pallidè fusci, apice obscuriores, subtus flavi: alæ griseæ; squamulæ et nervi fusca; stigma parvum; metalarum nervi pallidi.

Fem.—Abdomen obscurè viride, ovatum; discus cupreo-viridis: pedes virides; trochanteres nigri; tarsi flavi, apice fusci; protarsi, ungues et pulvilli fusci. (Corp. long. $\frac{5}{4}$ —1 lin.; alar. $1\frac{1}{2}$ — $1\frac{5}{4}$ lin.)

June; on grass; Windsor Forest.

†† *Mesothoracis parapsides scuto ferè in unum confusæ.*

‡ *Antennæ 11-articulatæ.*

GENUS IV. EUNOTUS,^d Walker.

Mas.—Corpus convexum, crassum, latum, contractum, quasi squameum, vix pubescens: caput maximum, thorace latius, breve:

^d eò benè, *νῶτος* dorsum.

antennæ 11-articulatæ, clavatæ, thorace breviores; articulus 1^{us}. linearis, gracilis; 2^{us}. mediocris; 3^{us}. et 4^{us}. vix conspicui; 5^{us}. et sequentes ad 8^{um}. gradatim longiores et latiores; clava articulis 8^o. et 9^o. multò longior et latior, apice quasi truncata: thorax ferè quadratus: prothorax parvus, brevissimus: mesothoracis parapsidum suturæ vix conspicuæ; paraptera et epimera benè determinata; scutellum ferè rotundum, posticè subproductum et abdominis basin attingens: metathorax supra vix conspicuus: abdomen ferè quadratum, paullo longius quàm latum, quasi subtilissimè squameum; segmentum 1^{um}. maximum, reliqua omninò obtegens et ultra abdominis apicem productum: pedes simplices, graciles, breves: alæ breves, angustæ: nervus alâ dimidio brevior; humeralis longus; ulnaris brevis; cubitalis radiali longior et angulum plerisque hujus familiæ acutiorem fingens.

Sp. 1. Eun. cretaceus. Mas. *Nigro-viridis, antennis fulvo-fuscis, pedibus fuscis, alis subfuscis.*

Nigro-viridis, obscurus: oculi ocellique rufo-fusci: antennæ fulvo-fuscae; articulus 2^{us}. obscurè fuscus: abdomen quasi subtilissimè squameum, basi læve: pedes nigro-fusci; coxæ virides; tibiæ pallidè fuscae; gennæ tarsique flava, horum articulus 5^{us}. unguis et pulvilli fusci: alæ subfuscae; squamulæ et nervi fuscae; stigma minimum. (Corp. long. $\frac{1}{2}$ lin.; alar. $\frac{3}{4}$ lin.)

Fem.—Aptera.

June and September; on chalk cliffs in the Isle of Wight. I found one specimen of the female in the same situation, but have since lost it.

†† Antennæ 12-articulatæ.

Clava	{	mediocris. Thorax apice	{	latus	V. MERAPORUS.
				angustus . . .	VI. METASTENUS.
		maxima		VII. METOPON.	

GENUS V.—MERAPORUS,^c Walker.

Corpus breve, vix pubescens: *maris* caput magnum thorace latius, *fem.* thorace vix latius: mandibulæ 4-dentatæ, subquadratæ, ferè rectæ, intùs indentatæ, similes; dentes obtusi, parvi, subæquales: maxillæ elongatæ, subarcuatæ, apice angustæ, acuminatæ; palpi 4-articulati, mediocres, filiformes; articulus 2^{us}. 1^o. paullo longior;

^c μέπος pars, ἀποπος egenus.

3^{us}. 1°. brevior; 4^{us}. linearis, 2°. et 3°. longior, apice acuminatus: mentum elongato-ovatum, posticè angustius: labium parvum, rotundatum, integrum, anticè ciliatum; palpi 3-articulati, breves, crassi; articulus 2^{us}. brevissimus; 3^{us}. acuminatus: antennæ corporis dimidii longitudine, clavatae; articulus 1^{us}. gracilis, linearis; 2^{us}. elongato-cyathiformis, mediocris; 5^{us}. et sequentes ad 9^{um}. gradatim latiores; clava ovata aut elongato-ovata, plana, articulis 8°. et 9°. latior et paullo longior: thorax ovatus, abdomine longior: prothorax et metathorax parvi, ille brevis: mesothoracis parapsides scuto in unum confusæ; paraptera et epimera benè determinata: *maris* abdomen brevissimum, rotundum; segmentum 1^{um}. maximum, ejus ferè dimidium occupans; reliqua brevissima: *fem.* abdomen ovatum, thorace vix brevius, subtus paullo carinatum, apice acuminatum et sparsè pilosum; segmentum 1^{um}. magnum; sequentia breviora, subæqualia: pedes simplices, graciles: alæ brevissimæ aut mediocres; nervus humeralis ulnari multò longior, ramulum rejiciens nullum; cubitalis radiali paullo brevior; stigmati ramulus ferè obsoletus.

Sp. 1. Mer. graminicola. Mas et Fem. *Viridi-æneus, antennis aut flavis aut fuscis (mas) aut nigris (fem.), pedibus flavis aut fuscis, alis vix ullis.*

Mas.—Viridis, quasi subtilè squameus: oculi ocellique rufi: antennæ flavæ; articulus 2^{us}. pallidè fuscus; clava ovata: mesothoracis scutellum æneo-viride: abdomen viridi-æneum, subtilissimè squameum, glabrum, basi viride: pedes flavi; coxæ virides; tarsi pallidè flavi; articulus 5^{us}., unguis et pulvilli fusci: alæ hyalinæ, brevissimæ, volatu ineptæ.

Fem.—Obscurè viridis: antennæ nigræ; articulus 1^{us}. pallidè rufus: abdomen viridi-æneum, apice sparsè pilosum: pedes pallidè rufi; coxæ æneæ; meso- et metatarsi flavi, apice necnon unguis et pulvilli fusci. (Corp. long. $\frac{1}{3}$ — $\frac{3}{4}$ lin.)

Var. β.—*Mas*, antennæ articulis 3°. 4°. et 5°. pallidè fusci: thorax et abdomen omninò viridi-ænea.

Var. γ.—*Mas*, antennæ articulis 3°. et 4°. pallidè fuscis.

Var. δ.—*Mas*, antennæ articulo 1°. fusco.

Var. ε.—*Mas*, æneus: caput æneo-viride: antennæ rufo-fuscae; articuli 1°. ad 5^{um}. fusci: metathorax viridis: femora fusca.

Var. ζ.—*Mas*, viridi-æneus: caput, thorax anticè et abdomen basi viridia: antennæ fuscae; clava rufa: femora fusca.

Var. η.—*Mas*, omninò æneus.

Var. θ.—*Mas*, caput et thorax viridia : abdomen æneo-viride, basi viride : protarsi omninò pallidè flavi.

Var. ι.—*Mas*, caput viride : thorax viridi-æneus : abdomen cupreo-æneum.

Var. κ.—*Mas*, æneus : protarsi articulo 5^o. pallidè fusco.

Var. λ.—*Mas*, æneus : femora pallidè fusca.

Var. μ.—*Mas*, æneo-viridis : abdomen cupreo-æneum, basi viride : femora pallidè fusca.

Var. ν.—*Mas*, æneo-viridis : antennæ fuscæ ; articulus 1^{us}. flavus, apice fuscus ; 2^{us}. nigro-fuscus : abdomen cupreo-æneum, basi æneo-viride.

Var. ξ.—*Mas*, antennæ articulis 1^o. et 2^o. fuscis : femora fusca, apice flava.

Var. ο.—*Fem.* caput et thorax æneo-viridia : abdomen cupreo-æneum : femora basi fusca.

Var. π.—*Fem.* antennæ articulo 1^o. apice fusco.

Var. ρ.—*Fem.* femora viridia ; tibiæ pallidè fusca.

Var. σ.—*Fem.* femora et tibiæ pallidè fusca.

Var. τ.—*Fem.* obscurè æneus : abdomen basi cupreum.

Var. υ.—*Fem.* obscurè viridis : antennæ articulo 1^o. fusco : abdomen basi æneo-viridi et nitentius : femora et tibiæ supra pallidè fusca.

Var. φ.—*Fem.* æneus : caput viride : femora et tibiæ pallidè fusca.

Var. χ.—*Fem.* æneus : antennæ articulo 1^o. obscurè fusco.

Var. ψ.—*Fem.* viridis : mesothoracis scutellum et abdomen apice ænea.

Var. ω.—*Fem.* antennæ nigro-fuscæ.

Var. αα.—*Fem.* æneo-viridis : thorax æneus.

Var. ββ.—*Fem.* omninò viridis : antennæ articulo 1^o. nigro-fusco.

August and September ; on grass in fields near London. September ; Isle of Wight, Westmoreland and Cumberland ; New Lanark, Scotland.

Sp. 2. Mer. alatus. *Mas.* *Æneo-viridis, antennis pedibusque flavis, alis subflavescentibus.*

Viridis, parùm nitens : oculi ocellique rufi : antennæ flavæ ; articulus 2^{us}. pallidè fuscus ; clava elongato-ovata : mesothoracis scutellum, paraptera et epimera viridi-ænea : abdomen æneo-viride, nitens, glabrum, basi lætè viride ; sexualia flava : pedes flavi ; coxæ virides ; tarsi apice, ungues et pulvilli fuscii ; meso- et metarsi pallidè flavi : alæ hyalinæ, amplæ, paullò flavescentes ; squamulæ et nervi fulvæ ; stigma parvum. (Corp. long. $\frac{1}{2}$ — $\frac{2}{3}$ lin. ; alar. $\frac{2}{3}$ — $\frac{3}{4}$ lin.)

- Var. β.*—Abdomen viridi-cupreum, basi lætè viride.
Var. γ.—Æneo-viridis: antennæ articulis 1^o. ad 4^{um}. fuscis: abdomen basi et metathorax viridia.
Var. δ.—Antennæ fulvæ; articulus 2^{us}. obscurior.
Var. ε.—Viridi-æneus: antennæ omninò flavæ: abdomen basi viride.
Var. ζ.—Viridi-æneus: abdomen basi et metathorax viridia.
Var. η.—Abdomen basi cyaneo-viride.
Var. θ.—Antennæ omninò flavæ: abdomen cupreum, basi apiceque viride.
Var. ι.—Caput et thorax obscurè viridia: antennæ articulis 1^o. ad 4^{um}. fuscis.
Var. κ.—Æneo-viridis: abdomen viridi-æneum, basi viride.
Var. λ.—Lætè viridis: abdomen viridi-æneum, basi viride.
Var. μ.—Var. præcedenti similis: antennæ articulis 1^o. ad 4^{um}. fuscis.

July to September; on grass in fields; near London.

Sp. 3. Mer. exiguus. Mas. *Viridis, præcedenti multò gracilior, antennis fuscis, pedibus fulvis, alis subfulvescentibus.*

Viridis: oculi ocellique rufi: antennæ fuscae; articulus 1^{us}. basi 2^{us}que apice flavi: pedes fulvi; coxæ virides; femora tibiæque apice et protibiæ omninò flava; tarsi apice, ungues et pulvilli fusci: alæ subfulvæ, amplæ; squamulæ et nervi obscuriora; stigma parvum. (Corp. long. $\frac{1}{2}$ lin.; alar. $\frac{2}{3}$ lin.)

October; on grass in fields; near London.

GENUS VI.—METASTENUS,^f *Walker.*

Fem.—Corpus sparsè pubescens: caput thorace paullò latius: mandibulæ 4 dentatæ, arcuatæ, similes, basi angustæ; dentes acuminati; externus et 2^{us}. magni, discreti; 3^{us}. et internus parvi, basi connecti: maxillæ elongatæ, subarcuatæ, acuminatæ, apice angustæ; palpi 4-articulati, filiformes; articulus 1^{us}. et 3^{us}. subæquales; 2^{us}. paullò longior; 4^{us}. 2ⁱ. longitudine, apice acuminatus: mentum ovatum: labium minutum, breve, quasi fissum; palpi 3-articulati, breves, crassi; articulus 2^{us}. brevissimus; 3^{us}. 1ⁱ. longitudine, apice acuminatus: antennæ 12-articulatæ, subfusiformes, corporis dimidio breviores; articulus 1^{us}. linearis,

^f μετά post, στενὸς angustus.

gracilis; 3^{us}. et 4^{us}. vix discernendi: 5^{us}. et sequentes ad 9^{um}. lati approximati, subæquales; clava conica, acuminata, articulis 8^o. et 9^o. vix longior: thorax brevis, paullò longior quàm latus; prothorax brevissimus; mesothoracis parapsidum suturæ indistinctæ, paraptera et epimera magna, scutellum ferè conicum: metathorax apice angustus: abdomen ovatum, thorace paullò longius, subtus convexum, basi abruptè angustius, apicem versus gradatim acuminatum; segmentum 1^{um}. magnum, ejus ferè trientem occupans; reliqua breviora, subæqualia: oviductus apicem non transiens: pedes graciles, simplices: alæ mediocres; nervus cubitalis longus, radialis ferè alæ apicem attingens; stigma ramulum brevissimum vix conspicuum emittens.

Sp. 1. Met. concinnus. Mas. *Cyaneus, antennis fuscis, pedibus fulvis, alis hyalinis.*

Cyaneus, obscurus: oculi ocellique rufi: antennæ pallidè fuscæ, basi obscuriores, subtus flavæ: abdomen cupreo-cyaneum, nitens, glabrum, basi viride, apice sparsè pilosum: pedes fulvi; coxæ cyaneæ; femora et tibiæ apice tarsique flava; horum articulus 5^{us}., unguis et pulvilli fusci; protarsi articulo 1^o. fulvo: alæ hyalinæ; squamulæ et nervi fulva; stigma parvum. (Corp. long. $\frac{3}{4}$ lin.; alar. 1 lin.)

Var. β .—Antennæ omninò fuscæ.

August; on grass in fields: near London.

GENUS VII.—METOPON,^s Walker.

Fem.—Sparsè pubescens, quasi minutè squameum: caput maximum, thorace multò latius: antennæ 12-articulatæ, clavatæ, corporis dimidio longiores, apices versus crassissimæ; articulus 1^{us}. gracilis, linearis; 2^{us}. brevis; 5^{us}. et sequentes ad 9^{um}. longitudine subæquales, latitudine crescentes; clava maxima, elongato-ovata, apice acuminata, articulis 8^o. et 9^o. multò latior et longior: thorax brevis, ferè rotundus: prothorax minimus, supra vix conspicuus: mesothorax magnus; parapsides scuto in unum confusæ; paraptera et epimera benè determinata; scutellum convexum, ferè rotundum: metathorax mediocris: abdomen parvum, angustum, compressum, læve, thorace vix longius, supra planum lateribus elevatis, subtus carinatum; segmenta subæqualia: pedes graciles, simplices: alæ mediocres; nervus

natum, subtus plus minusve angulatum; segmenta subæqualia: pedes graciles, simplices: alæ mediocres; nervus radialis cubitali paulò longior; stigma ramulum brevissimum emittens.

Sp. 1. Plat. nobile. Fem. *Viride, antennis fulvis, pedibus flavis, alis hyalinis.*

Lætè viride, sparsè pubescens: os flavum: oculi ocellique rufi: antennæ fulvæ, corporis triente vix longiores, supra pallidè fuscæ, basi obscuriores: thorax elongato-ovatus; mesothorax posticè viridi-cyaneus: abdomen elongato-ovatum, micans, ferè læve, thorace paulò longius, sparsè albo pilosum, subtus angulatum, apice acuminatum; discus cupreus: pedes lætè flavi; coxæ virides; mesofemora subtus prope apices setâ nigrâ armata; protibiæ et protarsi fulvæ; meso- et metatarsi apice, ungues et pulvilli fusci: alæ hyalinæ, albæ; squamulæ et nervi flava, hi ante costam attingunt obscuriores; stigma minutum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{3}$ lin.; alar. $1\frac{2}{3}$ — $1\frac{5}{8}$ lin.)

Var. β .—Abdominis discus cyaneo-viridis; segmenta apice obscurè cuprea: meso- et metafemora basi fulva.

Var. γ .—Thorax omninò viridis: abdomen viride, basi apice et subtus cyaneo-viride; discus cupreus: meso- et metafemora basi fulva.

September; on grass in fields; near London. Isle of Wight.

Sp. 2. Plat. laticorne. Fem. *Præcedentis colore, antennis brevioribus et latioribus.*

Viridè, sparsè pubescens: oculi ocellique rufi: antennæ fulvæ, corporis triente paulò breviores; supra pallidè fuscæ: thorax elongato-ovatus: abdomen thorace longius, sublineare, ferè læve, sparsè albo pilosum, subtus angulatum, apice acuminatum pilosius et paulò attenuatum; segmentum 1^{um}, 2^{um}, et 3^{um}, apice cuprea; apicale æneum: pedes fulvi; coxæ virides; femora basi fusca, apice flava; meso- et metatibiæ basi flavo cingulatæ; meso- et metatarsi pallidè fulvi, apice fusci; ungues et pulvilli fusci: alæ hyalinæ, albæ; nervi et squamulæ fulvæ, illi apice pallidiores; stigma minutum; metalarum nervi pallidè flavi. (Corp. long. $1\frac{1}{2}$ lin.; alar. $1\frac{3}{4}$ lin.)

August; on grass in fields; near London.

Sp. 3. Plat. teliforme. Mas et Fem. *Præcedentium colore, gracilius, abdomine longiore.*

Mas.—Lætè viride, sparsè pubescens: os flavum: oculi ocellique rufi: antennæ fulvæ, corporis dimidii longitudine; articuli 2º. basi fusco ad 6^{um}. supra fusco-fulvi: thorax sublinearis: abdomen sublineare, ferè læve, thorace paullò brevius et angustius; discus cupreus: sexualia pallidè fusca: pedes lætè flavi; coxæ virides; protibiæ et protarsi fulva; meso- et metatarsi apice, ungues et pulvilli fuscii: alæ hyalinæ, albæ; squamulæ et nervi straminea; stigma parvum.

Fem.—Antennæ paullò graciliores, corporis trientis longitudine; articuli 2º. ad 10^{um}. supra pallidè fuscii: abdomen cyaneo-viride, sublineare, thorace dimidio longius, paullò compressum, apice acuminatum et attenuatum, subtus angulatum: oviductus flavus, subexertus; tegmina nigra: protibiæ basi flavæ. (Corp. long. $\frac{5}{4}$ —1 $\frac{1}{4}$ lin.; alar. 1—1 $\frac{1}{2}$ lin.)

Var. β.—*Fem.* antennæ articulis omnibus supra pallidè fuscis: abdomen viridi-cyaneum; segmenta apice viridia.

Var. γ.—*Fem.* abdomen supra æneo-viride.

Var. δ.—*Fem.* abdomen omninò viride.

September; Isle of Wight.

Sp. 4. Plat. prasinum. Fem. *Præcedentium colore, P. teliformi et laticorni brevius illoque latius, P. claro abdomine non subtus angulato discrepans.*

Lætè viride, sparsè pubescens: oculi ocellique rufi: antennæ fulvæ, corporis triente vix longiores; clava lætè flava: thorax elongato-ovatus: abdomen elongato-ovatum, thorace vix longius, ferè læve, albo sparsè pilosum, subtus convexum, apice acuminatum non attenuatum; discus æneo-viridis: pedes lætè flavi; coxæ virides; femora basi fulva; protibiæ et protarsi fulva, hi apice pallidè fuscii; meso- et metatarsi apice, ungues et pulvilli fuscii: alæ hyalinæ, albæ; squamulæ et nervi straminea; stigma minutum. (Corp. long. $\frac{5}{4}$ —1 lin.; alar. 1 $\frac{1}{4}$ —1 $\frac{1}{2}$ lin.)

Var. β.—Antennæ articulis 1º. ad 4^{um}. supra pallidè fuscis: abdominis discus cupreo-viridis.

Var. γ.—Antennæ articulis 1º. ad 10^{um}. supra fuscis.

Var. δ.—Abdomen omninò viride: femora basi fusca.

Var. ε.—Abdominis latera cyaneo-viridia.

September; Isle of Wight.

Sp. 5. Plat. cincticorne. Mas et Fem. *Præcedentium colore, antennis fulvis, mas; aut pallidè fuscis, fem.; fusco cingulatis.*

Mas.—Lætè viride, vix pubescens: oculi ocellique rufi: antennæ fulvæ, corporis dimidio paullò breviores; articulus 2^{us}. basi nigro-fuscus; 6^{us}. et sequentes ad 10^{um}. basi fusci; clava fusca, basi flava: thorax elongato-ovatus: abdomen sublineare, thoracis longitudine sed paullò angustius; discus æneo-viridis: sexualia pallidè fusca: pedes lætè flavi; coxæ virides; protibiæ fulvæ; protarsi pallidè fusci; meso- et metapedum tarsi apice, ungues et pulvilli nigro-fusci: alæ hyalinæ, albæ; squamulæ et nervi fulva; stigma parvum; metalarum nervi pallidè flavi.

Fem.—Paullò gracilius: antennæ pallidè fuscæ, corporis dimidio breviores; articuli basi obscuriores; 1^{us}. nigro-fuscus: caput posticè æneo-viride: abdomen viridi-cyaneum, elongato-ovatum, thorace paullò longius, subtus angulatum, apice acuminatum non attenuatum; discus æneus: oviductus subexertus: femora fusca, apice flava; protibiæ pallidè fuscæ; meso- et metapedum tarsi apice, ungues et pulvilli fusci. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ lin.)

May; on grass in fields; near London.

Sp. 6. Plat. terminale. Fem. *Præcedentium colore, P. clarolaticorni et prasino abdomine angustiore, P. teliformi abdomine breviorè discrepans.*

Lætè viride, vix pubescens: oculi ocellique rufi: antennæ flavæ, corporis dimidio vix longitudine; articulus 3^{us}. et sequentes basi obscuriores: thorax elongato-ovatus: abdomen æneum, sublineare, compressum, thorace longius, basi viride, subtus paullò angulatum, apice acuminatum vix attenuatum: pedes lætè flavi; coxæ virides; femora fulva, apice flava; tarsi apice, ungues et pulvilli fulvi: alæ hyalinæ, albæ; squamulæ et nervi pallidè flava; stigma minutum. (Corp. long. $1\frac{1}{2}$ lin.; alar. $1\frac{1}{2}$ lin.)

August; on grass in fields; near London.

GENUS IX.—AMBLYMERUS,ⁱ Walker.

Fem.—Corpus crassum, latum, quasi squameum, sparsè pubescens: caput breve, thorace vix latius: mandibulæ 4-dentatæ, sub-

ⁱ Ἀμβλύς obtusus, μέγος pars.

quadratae, paullò arcuatae, similes, intùs breviores et emarginatae; dens externus et 2^{us}. mediocres, acuti; 3^{us}. et 4^{us}. parvi, obtusi: maxillae elongatae, subarcuatae, acuminatae, apice angustae et ciliatae; palpi 4-articulati, filiformes; articuli 1^o. ad 3^{um}. breves, subaequales; 4^{us}. 2ⁱ. et 3ⁱ. longitudine, apice acuminatus: mentum elongato-ovatum, angustum: labium parvum, angustum, quasi fissum; palpi 3-articulati, filiformes, breves, crassi; articulus 2^{us}. brevissimus; 3^{us}. apice acuminatus: antennae 13-articulatae, clavatae, thorace breviores; articulus 1^{us}. gracilis, linearis; 2^{us}. elongato-cyathiformis; 5^{us}. et sequentes ad 10^{um}. gradatim breviores et latiores; clava ovata, plana, articulis 9^o. et 10^o. latior sed vix longior: thorax ovatus, convexus: prothorax brevissimus: mesothoracis parapsidum suturae vix conspicuae; scutellum ferè rotundum; paraptera et epimera benè determinata: abdomen ovatum, ferè laeve, subtus carinatum et nonnunquam angulatum, apice acuminatum; segmentum 1^{um}. ferè trientis longitudine; reliqua breviora, subaequalia: pedes simplices, latiusculi: alae plerumque latae; nervus humeralis ulnari longior, ramulum rejiciens nullum; cubitalis radiali dimidio brevior, stigmatè ramulum brevissimum emittente terminatus.

Sp. 1. Amb. amænus. Fem. *Viridis aut æneo-cupreus, antennis fuscis, abdomine non subtus angulato, pedibus flavis aut fulvis, alis hyalinis, proalis nonnunquam subflavescentibus.*

Lætè viridis, caput thoracis latitudine: oculi ocellique rufi: antennae fuscae; articulus 1^{us}. et 2^{us}. pallidè rufi: capitis, prothoracis mesothoracisque latera cupreo-viridia: abdomen cupreum, subtus carinatum non angulatum, apice pilosum; segmenta basi et utrinque viridia: pedes flavi; coxae virides; metatibiæ intùs fulvo vittatae; meso- et metatarsi straminei, articulo 5^o., unguibus et pulvillis fuscis; protarsi articulo 5^o. rufo: alae hyalinae, latae; squamulae et nervi pallidè flava; stigma minimum. (Corp. long. $\frac{5}{4}$ — $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ — $2\frac{1}{4}$ lin.)

Var. β.—Antennae articulis 3^o. ad 10^{um}. rufo-fuscis.

Var. γ.—Thoracis dorsum cupreo variegatum: abdomen cupreum, basi et utrinque viridi variegatum: metatibiæ omninò flavæ.

Var. δ.—Antennae articulo 2^o. rufo: thorax æneo-viridis; segmentorum margines virides: femora et metapedum tibiæ pallidè rufa.

Var. ε.—Abdomen viride, apice cupreum; discus chalybeo fasciatus: femora, meso- et metatibiæ fulva, apice flava.

Var. ζ.—*Var. ε.* similis : abdomen cupreum, basi æneo-viride.

Var. η.—Antennæ articulo 2^o. supra fusco.

Var. θ.—Æneo-viridis : thorax anticè et utrinque cupreus : femora, tibiæ et protarsi pallidè rufa; meso- et metatibiæ apice flavæ : proalæ sub-nervum ulnarem paullò flavescentes.

Var. ι.—*Var. θ.* similis, æneo-cupreus : caput viridi-æneum, anticè et posticè viride.

Var. κ.—Thorax æneo-viridis ; scutellum cupreum.

Var. λ.—Viridis : thorax posticè æneo-viridis : abdominis segmentum 1^{um}. viride, micans.

August; on oak trees, &c.; near London. September; Isle of Wight.

Sp. 2. Amb. dubius. Fem. *Viridis aut æneus, præcedenti angustior, antennis fulvo fuscis, pedibus fulvis, alis hyalinis vix flavescentibus.*

Lætè viridis, caput thoracis latitudine : oculi ocellique rufi : antennæ fulvæ articuli 1^o. ad 4^{um}. flavi; clava fusca : abdomen æneum, basi viride nitentius, subtus carinatum non angulatum : pedes fulvi; coxæ virides; femora fusca, apice flava; tibiæ apice flavæ; mesofemora subtus ante apices setâ validâ armata; tarsi apice, ungues et pulvilli fusci : alæ hyalinæ, minimè flavescentes; squamulæ et nervi pallidè fusca; stigma minimum. (Corp. long. $\frac{5}{4}$ —1 lin.; alar. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.)

Var. β.—Antennæ fuscæ; articulus 1^{us}. omninò et 2^{us}. subtus flavi : femora apice fulva; metatibiæ fuscæ, apice flavæ; tarsi et protibiæ flava, illi apice fusci.

Var. γ.—Æneus : abdomen basi viride, apice cupreum, segmenta apice nigro-ænea: pedes fulvi; coxæ æneæ; metafemora inermia?; meso- et metatarsi flavi, apice nigro-fusci.—Species distincta.?

Var. δ.—*Var. γ* similis : abdomen nigro-æneum, basi apiceque viride.

August; near London. September; Isle of Wight.

Sp. 3. Amb. validus. Fem. *Æneus, viridi et cupreo variegatus, antennis fuscis, abdomine subtus angulato, pedibus fulvis, alis hyalinis, nonnunquam subflavescentibus.*

Cupreo-æneus : caput æneum, posticè æneo-viride, thorace paullò latius : oculi ocellique rufo-fusci : os pallidè flavum : antennæ fuscæ; clava obscurior; articulus 1^{us}. pallidè rufus : abdomen

nigro-æneum, subtus angulatum, basi cupreo-æneum nitentius: pedes fulvi; propedes flavi; coxæ æneæ; ungues et pulvilli fuscii; meso- et metapedum genua et tarsi pallidè flava, hi apice fuscii: alæ subflavescentes: squamulæ fulvæ; nervi pallidiores; stigma minutum. (Corp long. $1-1\frac{1}{4}$ lin.; alar. $1\frac{1}{4}-1\frac{2}{3}$ lin.)

Var. β.—Caput et thorax obscurè cupreo-ænea, illum posticè viride: abdomen cupreo-viride, basi nitentius; discus nigro-æneus: alæ vix subflavescentes.

Var. γ.—Æneus: caput viride: antennæ pallidè fuscæ; articulus 1^{us}. flavus: abdomen nigro-æneum, basi viride nitentius; segmenta apicalia viridescencia: coxæ virides; profemora fulva: alæ omninò perlucidæ.

August; near London. New Lanark, Scotland.

ART. XXVIII.—*Entomological Society.*

SEVENTH SITTING.—APRIL 7.

WE observed Dr. Ure among the strangers present.

THE PRESIDENT informed the meeting that Mr. Walker and Mr. Newman had withdrawn their names from the council of the Society, and that it was necessary that the vacancies thus occasioned in the council list be filled up by the Society. The council had met on the subject, and had agreed to propose to the meeting the name of Mr. Hanson, instead of Mr. Walker, and the name of Dr. Roget, instead of Mr. Newman.

THE SECRETARY read letters from M. Wiedemann and M. Lefebvre, who had been elected honorary members of the Society.

THE SECRETARY read a paper by Mr. Spence, detailing a curious mode, adopted in Italy, of excluding the house-fly from houses. The plan consisted simply in straining a net, made of white thread, across the aperture of an open window: the meshes of the net were about half-an-inch in diameter. It had occurred to Mr. Spence, whether it could be the dread of a spider's-net which caused the flies to avoid this thread-net, but on consideration he had determined otherwise, and he was

totally at a loss how to account for so singular a circumstance. Mr. Spence expressed a wish that the metaphysical history of insects might be more attended to than had at present been the case; he thought much instruction would result from it.

The SECRETARY read a paper by Mr. Saunders, on some Indian Insects, among which some nocturnal *Cicindelæ* were particularly remarkable.

The SECRETARY read a notice, by Mr. B. Standish, of the discovery of the larva of *Cucullia Thapsiphaga* on the golden-rod in Darent-wood, in a south-west aspect; he found one specimen on the 8th, and a second on the 23d, of September. They came out of the chrysalis in the following June, and proved to be male and female. An exquisite drawing of the larva, by a nephew of Mr. Standish, was presented to the Society.

The SECRETARY read an abstract of the Entomological affairs of the Linnæan Society. A paper had been read by Mr. Newman, giving an arrangement of the Annulate animals, and of that particular portion of them known as *insects*, solely by the metamorphosis. Mr. Newman referred the metamorphosis of insects to the change always going on in organized beings, and considered that insects had truly but three stages of existence: the *egg*, or foetal; the *larva*, or adolescent; and the *imago*, or adult.

The SECRETARY read the remainder of Mr. Hope's paper on Amber Insects.

Dr. URE made some observations on the chemical properties of amber and anime: he had found (as we understood) amber soluble on the surface only, but anime was perfectly converted into gelatinous matter by alcohol and spirit of caoutchouc.

Col. SYKES made some observations, in reference to the paper by Mr. Saunders, on the singular places selected by insects for nidification; he instanced one which had built its nest in a flute.

EIGHTH SITTING.—MAY 5.

The SECRETARY read letters from Signor Passerini, of Florence, and Dr. Hammerschmid, of Vienna.

The SECRETARY read a paper by himself, on the onion-fly, and the *larva* of *Tipula*.

The SECRETARY read a description by the Rev. F. W. Hope, of two new and remarkable Coleopterous insects from Swan River.

The SECRETARY read a paper by Mr. W. B. Spence, illustrative of a passage in Herodotus, relating to the defence adopted by the fishermen of Egypt against the nightly attacks of gnats.

The SECRETARY read a second notice by Mr. B. Standish of *Cucullia Thapsiphaga*. The insect, and an exquisite drawing of it by a nephew of Mr. Standish, were exhibited. Mr. Standish had heard Mr. Stephens express an opinion that the insect in question was not the *Thapsiphaga*, but he (Mr. Standish) felt convinced that it was.

The PRESIDENT.—As Mr. Stephens is present, perhaps he will be kind enough to favour us with his opinion on the subject.

Mr. STEPHENS.—I am certainly of opinion that the insect now exhibited, which I have carefully examined, is not the *Cucullia Thapsiphaga*, nor does it appear to me to belong to the same division of the genus. I consider it an entirely new insect, at present undescribed.

The SECRETARY read a paper by Mr. Shuckard, on the economy of some fossorial Hymenopterous insects.

An interesting discussion took place on insects injurious to agriculture, in which Mr. Yarrell, Mr. Waterhouse, &c. took part: in the course of it frequent allusion was made to the celebrated letter of Rusticus on the turnip-fly, published in the fourth number of this Magazine.

NINTH SITTING.—JUNE 2.

The Rev. W. KIRBY took the chair.

The SECRETARY read letters from M. Schöenherr, of Stockholm, and M. Lefebvre, of Paris.

The SECRETARY read a paper by Mr. Stephens on *Thyridopteryx Ephemeræformis*, a unique insect formerly in the collection of the late Mr. Haworth, and described by that

eminent Lepidopterist under the name of *Sphinx Ephemæformis*.

The SECRETARY read a paper by Mr. Waterhouse on the *larvæ* of various Coleopterous insects, and the *pupa* of *Raphidia*.

The SECRETARY read a paper by himself on the economy of *Odynerus Antilope*, one of the wasp tribe.

The SECRETARY read a paper by himself on the genera *Lepisma* and *Podura*, introducing some notices of Irish species of these genera, by Mr. Templeton.

Mr. SPENCE exhibited some very minute ants, which he said had swarmed to so great a degree at Brighton, and some parts of London, that, in several instances which had come to his knowledge, the inhabitants had found no other alternative than entirely quitting their houses.

The SECRETARY announced that the council of the Society had agreed to appropriate annually the sum of five guineas as a prize for the best essay on the history of any insect prejudicial to agriculture, accompanied with figures, and detailing the result of experiments made for prevention or cure of its attacks. The Turnip-fly is the subject of the first essay, which must be delivered, with a fictitious signature, in Bond-street, by the fourth Monday in January, 1835, and be addressed to the Secretary of the Society.

[We were the first to connect Entomology with Agriculture, and we can scarcely express the delight we feel in finding that our dear little "Fire-fly" has lighted the way to this spirit of inquiry. A word more:—Several of our correspondents have complained that it is beneath our dignity to report the affairs of the Entomological Society, and that the space might be better occupied. To these we say, that nothing which tends, in ever so humble a way, to the advance of Entomology, shall ever be passed over by us as beneath our dignity. We have abridged already as much as possible, but we cannot, and will not, consent to give up these notices.]

ART. XXIX.—*Entomological Notes.* By EDWARD NEWMAN.

(Continued from Vol. II., page 205.)

CLASS.—DIPTERA.

NATURAL ORDER.—SYRPHITES, *ined.*

GENUS.—ERISTALIS.

Eris. Stygius. Nigro-æneus; pedes nigri, tibiis ad basin luteis.

Black, shining, with a slightly metallic tinge; perfectly unicolourous: wings with the costal portion smoke coloured; the remainder perfectly transparent; the stigmal spot ochraceous, opaque, internally black: legs black, with the base of the tibiæ yellow.

Var. α of the male, with a bright brassy tinge.

Var. β of the male, with the basal joint of the tarsi yellow.

Taken on the south east and south coasts of England, frequenting the sea-walls, umbellate flowers, &c. In May, at Walton, by my friend, E. Doubleday.

[This is only a slight variety of *Eristalis æneus*, Fabr.—ED.]

CLASS.—COLEOPTERA.

NATURAL ORDER.—STAPHYLINITES, *ined.*GENUS.—PSEUDOPSIS,^a *Newman.*

Caput elongatum, angustum, antice rotundatum; epicranio valde depresso, partibus lateralibus supra oculos, iterumque parte media longitudinali, elevatis; clypeo prono, rotundato: antennæ filiformes 11-articulatæ, extus incrassatæ articulo apicali conico: maxilpalpi articulo apicali elongato, acuto, tenuissimo; proximo quadruplo majori, alia instrumenta cibaria haud examinavi: prothorax depressus fere circularis sed anticè et posticè paullò

^a Ψευδης falsus, οψis aspectus.

truncatus; lateribus, lineisque quatuor disci longitudinalibus perspicue elevatis: elytra valde depressa, marginibus, sutura, lineisque duabus singuli disco longitudinalis perspicue elevatis: segmenta septem nuda, haud elytris tecta, medio depressa, lateribus elevatis, versus telum magnitudine pedetentim decrescentia; telo elongato angusto.

Pseu. sulcatus. Niger, ore antennis pedibusque fuscis.

Head long, narrow, rounded before, black, with the mouth brown; crown of the head very much depressed, with an elevated line passing along each side above the eyes, and a third less elevated, distinct and regular, passing between these down the centre: antennæ brown, moniliform, composed of eleven joints, of which the apical is somewhat conical; the following are rather more broad than long, and very gradually decrease in size towards the head: maxillary feelers, with the apical joint long, pointed, and very slender; the next incrassated, four times the size of the apical: the disk of the prothorax is somewhat circular, but evidently truncate anteriorly, and slightly so posteriorly; it is much wider than the head, and very flat; it has the lateral edges and four perfectly straight longitudinal lines on the disk very conspicuously elevated, thus producing five distinct longitudinal indentations or furrows: the elytra are rather wider than the prothorax, very flat, with their margins, suture, and two longitudinal lines on each, conspicuously elevated; the lines are not perfectly straight, but, as they recede from the base of the elytra exteriorly, incline towards the suture: there are seven segments entirely uncovered by the elytra; these are much depressed in the middle and elevated at the sides, and gradually decrease in size to the last, which is very long and narrow: the prothorax, elytra, and uncovered segments, are dull black: the legs are brown. (Length $1\frac{1}{2}$ line.)

This singular insect was taken, by Mr. Walker, in the Isle of Wight, in the month of September. I regret not being able to furnish more complete characters from its mouth, but, as it is unique and exceedingly valuable, it would have been too great a risk to have attempted dissection. Its appearance is precisely that of a *Micropeplus*, to which genus it is evidently related, although presenting in so marked a manner the characters of *Staphylinites*. I hope the scientific reader will pardon the repetition of the supposed generic characters in English; for,

with only a single specimen of the genus in existence, it is difficult to say whether the sculpture on the prothorax and elytra is to be considered generic or specific; I must confess I incline to the latter opinion, and have named the insect accordingly. We find, in *Hister*, *Onthophilus*, *Oxytelus*, *Haliplus*, &c. &c., that similar markings serve merely to distinguish species.

ART. XXX.—*Notice of Entomological Works.*

1. *British Entomology*; by John Curtis, F.L.S., &c. — Nos. 123—126. — Pl. 490. *Lucanus Cervus*, (Coleoptera Lucanidæ). Mr. Curtis has greatly detracted from the merits of this beautiful plate, by giving a most confused and erroneous nomenclature to the dissections. The *clypeus* is called the *labrum*; the remarkable *galea* is treated as a lobe of the *maxilla*, &c. &c. If Mr. Curtis were to take a little more trouble with his anatomical nomenclature, he would find it not ill-bestowed. Pl. 491. *Cochylis rupicola*, (Lepidoptera Tortricidæ); 492. *Livia Juncorum*, (Hemiptera Psyllidæ); 493. *Tipula longicornis*, (Diptera Tipulidæ); 494. *Donacia Typhæ*, (Coleoptera Crioceridæ); 495. *Hydrocampa stratiotata*, (Lepidoptera Pyralidæ?); 496. *Diodontus gracilis*, (Hymenoptera Crabronidæ). The plate, and the accompanying letter-press, present another instance of inattention to correct nomenclature; the species figured has no such character as that represented in the *labrum*: whether Mr. Curtis has dissected one insect and described another, or has misapplied the term *labrum*, we neither know, nor can we stop to inquire. Pl. 497. *Acentropus Garnonsii*, (Trichoptera Phryganidæ); 498. *Tritoma bipustulatum*, (Coleoptera Tritomidæ); 499. *Callimorpha Jacobææ*, (Lepidoptera Lithosiidæ); 500. *Atractus literatus*, (Hemiptera Coreidæ); 501. *Tanypus nebulosus*, (Diptera Tipulidæ); 502. *Mycetæa hirta*, (Coleoptera Engidæ?); 503. *Asopia pictalis*, (Lepidoptera Pyralidæ); 504. *Heriades truncorum*, (Hymenoptera Apidæ); 505. *Platystoma seminationis*, (Diptera Muscidæ).

2. *Genera et Species Curculionidum, cum Synonymia hujus familiae*; a C. J. Schoenherr, &c. *Tomus II. Pars I^{ma}. Parisiis*, 1834.

3. *Annales de la Société Entomologique de France. Tome II. Trimestre 4, Paris*, 1834.—Among the contents are a classification of the *Cerambycidae*, with the characters of a host of new genera, by M. Audinet Serville, and various other interesting essays.

4. *Revue Entomologique, publiée par Gustave Silbermann. Strasbourg. Livraison 8. 1834*.—Almost the whole of this Number is occupied with an essay on the genus *Cicada*, by Professor Germar. The different sections of the genus are illustrated in eight plates, containing coloured figures of as many species.

5. *Iconographie du Règne Animal de M. le Baron Cuvier; par M. F. E. Guérin. Paris. Livraison 34. Insectes, Pl. 61*.—Several genera belonging to the class *Neuroptera*, and their dissections, are here delineated.

6. *Magazin de Zoologie; par F. E. Guérin. Paris*, 1833.—1. A monograph of the *Pselaphidae*, by M. Aubé, which is here concluded. He divides them into thirteen genera, three of which are new, viz. *Tyrus*, *Trimium*, and *Batrisus*. 2. Description of *Amallopodes*, a new genus of *Prionidae*, by M. Lequien, &c.

7. *Iconographie, &c. des Coléoptères d'Europe; par M. le Comte Dejean, et M. le Docteur J. A. Boisduval. Tome IV. Livraison 2*.—With illustrations of the genera *Anisodactylus*, *Bradybænus*, *Geodromus*, *Hypolithus*, *Gynandromorphus*, and *Harpalus*.

8. *Monographie des Cétôines, et Genres voisins, &c.; par M. H. Gory, et M. A. Percheron. Livraisons 2 et 3. Paris*, 1833.—Containing a detailed description, and a beautiful and correctly coloured figure, of each species.

9. *Annales des Sciences Naturelles. Tome Premier.*

Zoologie. Janvier, 1834. Paris.—The Botanical essays, formerly included in these “*Annales*,” now form a separate collection. This number contains two interesting essays: 1. “*Recherches sur l’ordre des Acariens en général et la famille des Trombidiés en particulier. Par Ant. Dugès. Premier Memoire.*” He divides them into seven families (*Trombidiei, Hydrachnei, Gamasei, Ixodei, Acarei, Bdellei*, and *Oribatei*), and establishes the following new genera: *Rhaphignathus, Rhyncholophus, Diplodontus, Arreneurus, Dermanyssus*, and *Hypopus*. 2. “*Recherches anatomiques et Considérations entomologiques sur quelques Insectes Coléoptères, compris dans les Familles des Dermestins, des Byrrhiens, des Acanthopodes, et des Leptodactyles; par M. Léon Dufour.*

10. *Die Arachniden. Getreu nach der Natur abgebildet und beschrieben von D. Carl. Wilh. Hahn.; Erster Band. Sechstes Heft. Zweiter Band. Erstes Heft. 1833.*—Species of the genera *Atypus, Epeïra, Micrommata, Thomisus, Uloborus, Drassus, Phalangium, Trogolus, Clubiona* and *Lycosa*, are here figured.

11. *Die Wander-oder Prozessions-Raupe (Bombyx processionea) in naturhistorisch-landespölyzeilich und medicinischer Hinsicht geschildert von Dr. A. H. Nicholai. Nebst einen Steindrucke. Berlin, 1833.*—The plate accompanying this pamphlet contains figures of the moth, with its pupa, larva, and nest.

12. *The Affinities of Plants with Men and Animals: a Lecture; by Edwin Lees. Edwards: London.*—Mr. Lees gives a new version of *analogy* and *affinity*. Ecce! “We perceive no *analogy* between a plant and a predaceous cat; but the cat, by smelling to, and playing with, pungent herbs, manifests a strong *affinity* with them. The child who brings home a handful of gaudy or fragrant flowers would be puzzled enough to make out an analogy between himself and his nosegay; but he might readily comprehend that the rich colours that charmed his eye, and the delicious odours that had attracted his scent, intimated design, and an intention that the colours and odours of the one were calculated to please

the senses of the other, and thus that an affinity or relationship was shewn between them in these respects. But when I say that the spongioles of the root of a plant act as tender nerves to the stem, by imbibing and conveying nourishment for its growth and support, I make use of an *analogy* which is well understood, though no one supposes that I mean to say these spongioles know what they are doing." (P. 4.) Will Mr. Lees allow us to throw the light of the "Fire-fly" on this subject for a single moment? *Analogy* is that external similarity observable between the hops so gracefully festooning the poles at Knightsford-bridge and the scarlet-runners in Mr. Lees' garden: *affinity* is the relationship between those rambling scarlet-runners and the pale-blossomed dwarf-beans growing at their feet.

13. *Magazine of Natural History*.—No. 39 contains but one Entomological article of any length; this is entitled, "On the Structure of Annulate Animals, and its Relation to their Economy; by *Omega*." It is the second of a series of letters on the same subject, and evidently emanates from the pen of an individual who is thoroughly master of his subject.

14. *Illustrations of British Entomology*; by J. F. Stephens, F.L.S.—Mr. Stephens has completed the *Coleoptera* and commenced a supplement; the *Lepidoptera* will be finished in one more number. We believe the remaining classes will be published by subscription; we hear that a large number of Entomologists have already sent in their names.

ART. XXXI.—*Varieties*.

13. *Eggs and Larvæ of Orgyia antiqua*.—A friend sent me a deposition of the eggs of *Orgyia antiqua*, which commenced hatching on the 21st of January, and have continued to evolve their larvæ until the present time (February 25); thus occupying the space of five weeks in completing the hatching of the whole brood. The majority of those that were hatched first are still alive, having eaten, since their evolution,

nothing but the top or lid of their respective egg-shells, which they devour, as do the larvæ of *Pieris Cratægi*.^a I am aware that Redi, and other entomologists, have observed that such larvæ as have been prevented from casting their first skins, owing to the want of alimentary stimulus, will continue to live in a state of perfect abstinence for many months; but as the instances are few and extraordinary, I anticipate that this will be granted a corner in your Magazine.

JAMES FENNELL.

14. *Preservation of Caterpillars*.—It is, perhaps, to be ascribed to the mode of preserving caterpillars being so imperfectly understood, that they so seldom gain a place in the entomological cabinet. It unfortunately does not appear that Mr. Abbott, (the author of *The Lepidopterous Insects of Georgia*), whom Mr. Kirby mentions as having been “remarkable for the admirable manner in which he prepared caterpillars, so as scarcely to differ from life,” has recorded the method he pursued. Not being acquainted with any professed entomologists, and, consequently, having only witnessed the plans adopted in the preservation of these creatures in our public museums, I know not whether the following directions may possess aught deserving of attention. If the caterpillar be hairy or spiny, enlarge the orifice of the anus, and from thence endeavour, by gentle pressure, performed with a smooth instrument, to squeeze out as much of the contents of the inside as possible; and while thus operating, let the subject be laid on a sheet of blotting paper, that the moisture exuded, being imbibed, may be prevented from wetting and spoiling the hairs or spines. This done, insert frequently fresh pieces of dry blotting paper, rolled round the end of a smooth piece of stick, and continue to do so, until the dryness of the paper, when retracted, indicates that no moisture remains within. Let the skin be now distended into its proper shape, by means of a stuffing of down, or other soft materials, (but not of sand, as recommended in some books,) taking the precaution of guarding against the attacks of destructive insects, by enclosing within a small quantity of camphor, cayenne pepper, and red oxide of lead; ingredients which, for this purpose, I have found very serviceable. In preserving

^a And of many other Lepidoptera.—Ed.

smooth, hairless caterpillars, care must be taken that their colours be not removed by a too rough application of the absorbing instrument. A specimen of the larva of *Cossus ligniperda*, in my possession, is partly divested of its reddish tinge, in consequence of its having been grazed internally by the absorber, a circumstance which shews that the colouring matter of this species lies beneath the surface.

JAMES FENNELL.

15. *Spider*. It is well known that there is found, in the palace of Hampton Court, a very large species of spider, called there the "Cardinal." Mr. Jesse, in his delightful *Gleanings in Natural History*, says, that he has only met with it in that locality, and conjectures that they have received the above appellation from their having been first observed in Cardinal Wolsey's Hall. Pray what scientific name has been conferred upon this species; is it *Hampton-Courtiensis*, *Wolseyensis*, or what?^b

JAMES FENNELL.

16. *Gossamer Spider*.—On the 2d of November, I observed, near Wednesbury, in Staffordshire, an unusual quantity of the floating spider-web, commonly known by the name of "gossamer;" and on carefully examining the ground, I found every object which projected above the level of the field, as bents of grass, sticks, and particularly stones, covered with an innumerable quantity of small spiders. On one stone alone there were more than seven hundred. These gossamer spiders are about a line in length, and black, with the exception of the palpi, which are bright red; and those of the male at least three times the length of those of the female.

R. F * * * * *

17. *Larva of Tipula*.—Near Wednesbury is a field in which are two kinds of soil very distinct from each other; one is a loose light sand, the other a heavy marly clay. In the spring of 1827 this field was cropped with barley, but the sandy part of it was so completely infested with the *larvæ* of a large *Tipula*, that, before the end of May, the crop was

^b We are ignorant in this matter, but hope that some entomologist will be so kind as to inform us.—ED.

wholly destroyed. The ground was then ploughed, and immense swarms of sparrows came and devoured the *larvæ* as the plough turned them up; it was then cropped with potatoes, and the *Tipula* disappeared. The clayey part of the field, to the very limit of the sand, entirely escaped the devastation; thus, apparently, proving the *Tipulæ* could not penetrate the clay.

R. F * * * * *

18. *Chelifer Cancroides*.—The habits of that little oddity, the *Chelifer Cancroides*, seem to have puzzled entomologists; at least, I cannot discover that they can assign any reason for its attachment to flies' legs. Perhaps the following facts may suggest a few queries which might elicit some light on this curious subject.

Last summer I watched the manœuvres of a *Musca Domestica* that had one of these crab-like dependents attached to its *femur*. It was in the window of a cold and damp out-office. The fly appeared but little annoyed, and continued to travel tardily about the glass, while its hanger-on busily occupied its free claw in seizing such minute objects as came in its way,—at least such appeared to be its business. On attempting to catch the fly, off it flew to another window with its wingless passenger. I followed closely and quickly, when lo! the little appendix relaxed its grasp, and dropped itself into a crevice in the frame, where I secured it. Intending to experiment, I put it into a pill-box with a fly, to the leg of which it soon clung, and would, with its neighbour's help, have speedily escaped, had it not been prevented by shutting them up together till another opportunity. But next morning my curiosity was dead. On recollecting these facts, the following queries occur to my mind:

Does not the *Chelifer* experience inconvenience, in consequence of its construction, when it would be pursuing its prey? and does it not take advantage of the leg which the fly so readily offers that it may ride out on its hunting excursions, and, by the aid of the fly's legs and wings, get cheaply conveyed from place to place? Is not one of its claws especially adapted for this purpose? and are not the resorts of the fly those which furnish prey for its occasional companion? If so, do not these circumstances present an additional instance of

accommodating provision, which is so often most beautifully illustrated in the habits of insects?^c

Denmark Hill.

G. MOORE.

19. *Metamorphosis of Ephemera*.—On a fine evening, towards the latter end of May, I was collecting in the neighbourhood of Brixton, near some ponds, when I was suddenly covered by a multitude of a small species of *Ephemera*,—I think the genus *Cloeon*. They settled on me apparently from my being the most conspicuous object near on which to undergo their final transformation. Their colour was of a dusky white, and opaque. They retained their position without moving, enabling me to observe beneath the glass the process by which these fragile creatures withdraw themselves from the comparatively cumbrous garment which envelopes their beautiful and aerial form.

Immediately on settling, the wings were laid flat at right angles with the body, and the insect remained about half a minute in a state of repose. A slight motion then appeared about the bases of the wings, which gradually collapsed, and were drawn alongside the *abdomen*. At this moment the insect resembled a piece of dirty cotton wool with little form. The elevated portion of the *thorax* now distended, and then gave way longitudinally, exhibiting the bright brown *thorax* of

^c The *Chelifer cancrroides* is very abundant throughout the year on planks and bricks that are placed on decayed vegetable matter, where it preys on minute Diptera, (*Molobrus*, *Scatopse*, &c.) *Lonchæa vaginalis*, a fly common in the same situations during the month of June, is particularly infested by it, and also by *Acari*, and may be often seen on windows with from one to four *Cheliferi* attached by the claw to its *trochanteres*, and apparently without sustaining any injury from them. The other day we put several of both into a bottle, and often, when the fly approached the *Chelifer*, the latter immediately extended one of its claws, and seized the fly by the end of the *tarsus*; with the other claw it grasped either the middle of the *tarsus*, or the costal nervure of the wing, and then loosened the hold of each of its claws alternately till it arrived at the *trochanter*, where it remained fixed. We added three other flies, belonging to the genera *Anthomyia*, *Sepsis*, and *Borborus*. The first, a much more active insect than the *Lonchæa*, was soon seized by a *Chelifer*. It used its utmost efforts to disengage its *tarsus* without success; however, the *Chelifer* soon relaxed its hold of its own accord. When we looked at the insects the following day, the *Lonchæa*, the *Anthomyia*, and the *Borborus* were alive, and only the first had a *Chelifer* attached to it; so, likewise, had the *Sepsis*, whose death was probably occasioned by confinement, not by any wound.—E.D.

the insect, which was rapidly followed by the head and anterior legs. After this effort the insect rested a few seconds. The next discernible motion was in the two or three last segments of the *abdomen*, where the muscles were in violent agitation, evidently for the purpose of extricating the fine *setæ* which adorn that part. The contractions continued upward; and the wings, freed from their flimsy covering, were fully developed, and in an instant the delivered captive took its flight: the whole process strongly resembling the drawing off of a tight glove. The whole operation did not, in most cases, exceed three minutes; in some cases less. Scarcely an instant elapsed between the full development of the insect and its taking flight: so rapidly did they acquire consistency. In some few instances I observed them coupled, in which case they soon died. I made a dozen or so find their way into a phial; they instantly deposited their eggs and died: one only, which I believe was a male, survived when I reached home, less than one hour after.

The number of the insect was truly surprising: they covered every part of my apparel, and my face and hands were not exempt. On my arrival at home my hat looked like a miller's, from being completely covered with the *exuviae*. I had taken several of these insects during the evening, and had put them into pill-boxes; almost all, however, were immature, and died without undergoing their metamorphosis; from which it would appear, that light and a free atmosphere are essential to its accomplishment. The principal swarm, however, appeared about an hour before sunset, and, I presume, enjoyed their hour's existence in one of the finest sunsets of this glorious summer.

The remarkable, and, I believe, peculiar habit, of the *Ephemeræ* to undergo a quadruple metamorphosis, deserves more notice than it has obtained. The insect appears to possess all the faculties of the perfect insect prior to this last change: it is true it does not fly so readily, and it is apparently of a more yielding matter: if disturbed in this state, although inactive, they will escape. Can any of your correspondents inform me as to the prior state of this tribe, and the characters of the *larvæ* and *pupæ*?

A. H. DAVIS.

Camberwell, August.

20. *Hymenopterous Insect parasitic on the Eggs of a Spider*.—A few days ago, on tearing open the bag or nest of the common geometric spider, I was very much surprised to find that, instead of eggs, it contained several empty *pupæ*-cases of one of the minute parasitical *Hymenoptera*, probably a species of *Mymar*, whose *larvæ* had evidently destroyed the brood of spiders. On a further search, I found that every spider's nest in its vicinity had been visited by the same parasite, and in one I detected a full grown *larva* of a Dipterous insect, most likely an *Exorista*, but, being unfortunately damaged in taking it out, I was unable to rear it. The eggs of those insects which leave them exposed are, it is well known, subject to the attacks of the *Mymares*, but I don't recollect an instance where either they, or the parasitical *Diptera*, have been noticed as depositing their "*Cuckoo*" eggs in those apparently so well secured as the spiders are by the thick and closely interwoven web which envelopes them. I will endeavour to detect the female *Mymar* ovipositing next summer, or at least to secure the perfect insect on its escape from the *pupæ*, for the examination of my friend Mr. Walker, whose contributions, in conjunction with those of Mr. Haliday, have thrown so much light on this hitherto neglected portion of the insect world.

March, 1834.

G. WAILES.

21. *Capture of Callicerus Spencii*.—In May last I took a single specimen in Battersea-fields, and for the last fortnight I have made many captures of this insect at this place, on the south side of hedges, by brushing; and shall be most happy to supply any of your friends with examples.

Croft, March, 1834.

G. T. RUDD.

22. *Asiraca pulchella*.—I have taken this insect, both males and females, in plenty, and not one of them agrees with the *Cicada crassicornis* of Panzer, as stated in your Magazine, Vol. I. p. 454. I have taken another species allied to, but distinct from either, near Oxford; and saw a second specimen, near Ugg-Mere, last season.

J. C. DALE.

23. *Carabus exasperatus*.—This insect is not *Carabus violaceus*. I have seen it alive in the Isle of Portland, and it is different from the *C. violaceus* I have seen elsewhere.

J. C. DALE.

24. *Lasioglossum tricingulum*.—This is certainly a different genus from *Halictus*, which may be seen by comparing the dissections in Curtis's plate.

J. C. DALE.

25. *Cerapteryx Hibernicus*.—This is, I believe, *Chareas Graminis*; but it is, at least, a fine and large variety, and Mr. Curtis is fully justified in his observations; he merely says, "it may be a new species."

J. C. DALE.

26. *Hippobosca Equina*.—In the Entomological Magazine, you have said that Mr. Curtis's figure of this insect is much too highly coloured; I beg to say that I have a specimen of the insect much more highly coloured than Mr. Curtis's figure.

J. C. DALE.

27. *Hister 4-maculatus*.—You are wrong in saying that the *Hister 4-maculatus*, of Curtis, is the *Hister sinuatus* of authors, and Mr. Curtis is right, for it certainly is the *H. 4-maculatus* of Linné, of Gyllenhal, and of Paykull. *H. sinuatus* does not belong to the same division; it has not, what has been termed, a marginal stria on the elytra, and is a smaller insect; its thorax is semiovate and truncated before, so that the sides are rounded, and the base very much broader than the fore part, and the apical tooth of the anterior tibiae is bidentate. Does this, I ask, agree with Mr. Curtis's description or figure?

J. C. DALE.

Blandford, 21st May, 1834.

28. *Smiera Mac Leanii*.—Dalman, in describing *C. Melanaris*, ♀, says "There is a white spot on each side between the eyes; the anterior tibiae are rufescent, pale at the base on the outside: thighs with a somewhat apical white lunule on both sides." If Dalman's insect, of which he took twenty specimens,

had been the opposite sex to mine, of which I have seen four, I should have suspected that they might be one species, but, even then, I should not have been justified in making them so with the above differences; and Dalman does not mention any varieties, neither do mine vary.

To J. C. Dale, Esq.

J. CURTIS.

[Our valued friends, Messrs. Dale and Curtis, can do us no more acceptable service, nor any for which we shall feel more truly obliged, than in thus pointing out what they consider our errors: their great experience will, among Entomologists, ensure respect for their opinions. Mr. Dale has entered into argument with us somewhat largely on the mode of our reviewing Mr. Curtis's work—this we suppress; but we have extracted, verbatim, *all* the supposed errors in our review which he points out; thus the reader will have both sides before him, and may judge for himself. We think Mr. Dale should, in the case of *Asiraca*, *Carabus*, and *Lasioglossum*, have given *proofs* of our being wrong; the simple assertion will, we fear, hardly carry conviction to the general reader.—ED.]

29. *Stylops Melittæ*.—On the 5th May, I took a male specimen of *Andrena nigro-cenea*, which was very evidently infested by a *Stylops*. I brought the bee home alive, and placed it, with flowers, beneath a tumbler; next morning I had the satisfaction to see that the parasite had emerged, and was in perfectly good condition. An examination of its thoracic segments has led me to the following conclusions: 1st. that the *prothorax* is a very slender segment, almost lost in the *mesothorax*, as in Diptera; 2dly. that the *mesothorax* is the same large and conspicuous segment as in Lepidoptera, Diptera, and Hymenoptera, having its *scutellum* (I use this word as it is usually understood in Diptera) remarkably elongate and developed: this segment bears the *pseudelytra* on its anterior portion laterally, yet the *prothorax* is so small that they appear to originate close behind the head; they appear the precise analogues of the tippets of Lepidoptera, and behind them originate the fore wings, which are large and spreading, and fold longitudinally: the *metathorax*

is a minor, but still very apparent segment; it protrudes on each side of the *scutellum* of the *mesothorax*, and bears a pair of crumpled, opaque, whitish hind wings, which are somewhat pedunculated, and much resemble the hind wings or *halteres* of Diptera; my friend, Mr. Walker, called my attention to these. The mouth I have not dissected; as far as may be ascertained without dissection, its mandibles are elongate, linear, and without any horizontal motion; its *maxipalpi* fully developed as in Diptera, but the *maxillæ* scarcely discernible; its *labium* distinct and triangular, as in Lepidoptera, but the *labipalpi* minute or obsolete. None of these characters seems sufficient to separate this genus from Diptera.

E. N. D.

30. *Bombus Regelationis*.—I found fine females of this beautiful bee, which, I believe, has not hitherto been recorded as British, feeding on the blossoms of the whortleberry, on the marshy summit of the Black Mountain. They were in great abundance, but exceedingly difficult to capture, owing to the high wind and the rapidity of their flight.

E. N. D.

31. *Sapyga prisma*.—Last autumn I observed the females of this rare insect in considerable numbers, settling on the leaves of a *Morella* cherry-tree in my father's garden. I captured two only. On Dinmore, the beautiful *Vicia sylvatica* is now in full flower, festooning many of the trees to the height of twenty or thirty feet; and, in some instances, completely hiding their own foliage. There are but few *umbelliferæ* in blossom; I have taken one *Pachyta octomaculata*; and *Atherix Ibis* is in profusion on the river banks, especially on the *Symphytum*, many beautiful varieties of which are in blossom, some of a splendid purple.

Leominster, 1st June.

GEORGE NEWMAN, Jun.

32. *Farmer's Magazine*, v. *Rusticus*.—Were *Rusticus* in England our pen would not be required to defend him: as it is, we offer the following to the inspection of our readers, simply to show, what appears to us, the unceasing desire to extinguish truth:

FARMER'S MAGAZINE.

"It occurred to the experimentalist to attack these eggs, which he did by making a pretty strong brine, in which the seed was soaked for twenty-four hours, taken out, dried, and sowed; *the plants rose freely*, on which neither grub, fly, nor beetle was to be seen."

RUSTICUS.

"I accordingly made some pretty strong brine, and soaked the seed in it for twenty-four hours; then dried it thoroughly, and with all the precautions I have mentioned above, I sowed it again, and with a kind of success—there was not a single fly, *but neither was there a turnip.*"

The plan of thus misrepresenting an author in good repute is now of every day occurrence: when pointed out, the commentator quietly eats his own words, laughing in his sleeve at the mischief he has done to a brother candidate for public favour, and apparently losing nothing in the esteem of those who would rather perish than be guilty of such actions.—ED.

33. *Metamorphosis of Insects*.—A paper on this subject, by Mr. Newman, has been read at the Linnæan Society; as its substance will eventually appear in this Magazine, either as original matter or as a review, we abstain from giving an abstract; its main object appeared to us to be the confirmation of the septenary system, as proposed in *Sphinx Vespiiformis*.—ED.

34. *Bombus opening the Nectary of Flowers*.—I have observed the great humble bee, *Bombus terrestris*, extracting the honey from the nectaries of the common Columbine; and, as I think the *modus operandi* has not hitherto been in print, I will relate it. The bee settles on the outside of the flower, looking upwards, then bites a small hole in the nectary with its mandibles, and instantly thrusts its proboscis into the aperture. On examining a number of flowers, not less than 250, I found that at least two-thirds of them were thus perforated.

E. N. D.

35. *Entomological Club Dinner*.—This was solemnized at the Bull Inn, Birch Wood, on the 21st of May last. Mr. Davis took the chair, and we observed among the company Messrs. Bowerbank, Hanson, Walker, Newman, Walton, W. Christy, J. Christy, Hoyer, Letts, Bennett, Bevington, &c.

THE
ENTOMOLOGICAL MAGAZINE.

OCTOBER, 1834.

ART. XXXII.—*Colloquia Entomologica.*

Γνωθι σεαυτον.

SCENE—*The Parlour at the Bull Inn, Birch-wood-corner.*

ERRO and ENTOMOPHILUS.

ENTOMOPHILUS, (*adjusting a wreath of Vicia cracca round Erro's head.*) There's a purple crown: have we not an arm-chair in the room? he must not sit on this footy affair: oh! yes, I'll place it on the table: there's a throne; come, mount up: next to the possession of great genius is the capability of discerning it, and the disposition of honouring it in others. Come, come, mount, and make a speech; prorogue the parliament.

ERRO. What! what! what! no, don't be silly, I'm not going to perch myself up there.

ENT. Ah! that's the way; talent is always wayward; I'll put the chair down then. Now, take this water-net in the right hand for a sceptre, and this box in the left, so; it's a globe, the emblem of universal sovereignty, that's it. There sits the king of entomology! the friend of the wise, the terror of all pretenders, the abstractor of Straus-Dürckheim, the Delta, the Omega, the Rusticus, the Editor, wit, and critic, of the Entomological Magazine. Oh king! live for ever!

ERRO.—

Ast illos centeni quemque sequuntur,
Purpurei cristis juvenes auroque corusci.

ENT. Answering the address in Hebrew; that's all right.

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U U

ERRO, (*Taking off the crown and admiring it*)—

Illæ continuo saltus sylvasque peragunt,
Purpureosque metunt flores.

ENT. Your majesty is very condescending. Now, thank the contributors; speak of the overflow of contributions; thank the public for the increased sale; say that the profits of the Magazine will be given to the Hope Assurance Company.

ERRO.—

Hic Venus indigno nati concussa dolore,
Dictamnū genitrix Crætæa carpit ab Ida,
Puberibus caulem foliis et flore comantem
Purpureo.

ENT. Sire, on behalf of my brother entomologists, I beg to thank your majesty for your continued good will, so warmly expressed, and to assure your majesty of our undiminished regard and obedience.

ERRO. It could not be the *Dictamnus*, after all. See, they begin to droop already.

Purpureus veluti cum flos succisus aratra
Languescit moriens; lassove papavera collo
Demisere caput, pluvia cum forte gravatur.

ENT. Another speech! that will do, Roey.

ERRO. You have never got me seeds of the Dinmore-hill vetch, *Vicia sylvatica*. I want it for my garden.

ENT. Oh! don't try to gardenize it: it is beautiful in the woods, where its graceful festoons glow with a thousand bunches of bloom, delicately tinted; but in a garden with prim brick walls, it would fret, pine, droop, dwindle, and die: don't try it.

ERRO. What! why not? it would climb the trellis-work, and I should guide it and train it with *Lophospermum* and *Maurandya*, managing them so as to make a blaze of bloom.

ENT. It would not grow, indeed, Roey; or, if it did, it would smother the *Maurandya*, and break down the trellis.

ERRO. The *Gladiolus Byzantinus* is a very favourite flower of mine. I am sure it is Ovid's Hyacinthus.

Talia dum vero memorantur Apollinis ore,
Ecce cruor qui fusus humi signaverat herbam,
Desinet esse cruor: Tyrioque nitentior ostro
Flos oritur; formamque capit quam lilia: si non

Purpureus color huic, argentius esset in illis.
 Non satis hoc Phœbo est: is enim fuit auctor honoris,
 Ipse suos gemitus foliis inscribit; et AI, AI
 Flos habet inscriptum.

ENT. I hope you are entertained.

ERRO. The AI AI are just the white marks which the gladiole or cornflax, whichever you call it, bears on the lower petals, and the "*Vaccinia nigra*," in "*Formosum pastor Corydon*," is the same flower. Old Heyne says, "*Vaccinia nigra esse eundem florem cum Hyacinthis poetarum*;" and Duncan the same,—"*Melius cum Turnebo et Salmasio dicemus Hyacinthum esse*." "*Martinus*," says Heyne, "*Hyacinthum poetarum lilium floribus reflexis sive Martagon esse putet*;" the *common Martagon lily*: but this could not be; for we find in Theocritus, "*Καὶ τὸ ἴον μέλαν ἐντὶ καὶ ἄγραπτα ὑακίνθος*," which will not suit the Martagon: but all these things must remain doubtful. Some commentator even says, that the Narcissus of the ancients was our common red Valerian!

ENT. What think you was the Narcissus?

ERRO. The Narcissus of Ovid was certainly our Narcissus or Daffodil; the yellow centre, with the white petals round it, is very accurately described.

Croceum pro corpore florem
 Inveniunt foliis medium cingentibus albis.

ENT. Roey, I must learn French.

ERRO. Ovid's Narcissus is a beautiful story.

Nec vigor, et vires, et quæ modo visa placebant,
 Nec corpus remanet, quondam quod amaverat Echo;
 Qui tamen ut vidit quamvis irata memorque
 Indoluit; quotiesque puer miserabilis "Eheu"
 Dixerat; hæc resonis iterabat vocibus "Eheu."

ENT. I must learn French; I know it must be useful—yes, I must learn it—I must, indeed—between ourselves, on purpose to puff myself in the French Magazines.

ERRO. M. Entomophilus a publié dans le Magasin Entomologique un traité sur l'Ostéologie des Insectes; ce savant a déployé la plus grande erudition et un génie vraiment étonnant.

ENT. I catch the idea of all that; it's about gardening; my mind's eye pictures you in a straw hat, half way up a little ladder, with a pair of scissors cutting off faded flowers and

withered leaves: now, was not that conveyed in what you have been saying?

Oh! could we do with this world of ours
As thou dost with thy garden bowers,
Reject the weeds and keep the flowers,
What a heaven on earth we'd make it!
So bright a dwelling should be our own,
So warranted free from sigh or frown,
That angels soon would be coming down,
By the week, or month, to take it.

Like those gay flies that wing through air,
And, in themselves, a lustre bear,
A stock of light still ready there,
Whenever they wish to use it;
So, in this world, I'd make for thee;
Our hearts should all like fire-flies be,
And the flash of wit and poesy
Break forth whenever we choose it.

ERRO. Would that my life were synchronous with such a blissful world; but, alas! how different is ours! Look on our entomological world, how barren the minds, not only of all wit and poesy, but of all greatness, and nobleness, and goodness! Ambulator, Hanson, Bird, and one other, are the only entomologists to whom I feel bound by any ties of kindred feeling, affection, or gratitude. The fourth shall be nameless; it is not well to detail the whole list of one's friends to every one with whom one may chance to have a gossip. (*Continues musingly and half aside.*)

Te vero mea quem spatiis propioribus ætas
Insequitur, venerande puer, jam pectore toto
Accipio, et comitem casus complector in omnes.
Nulla meis sine te quæretur gloria rebus;
Seu pacem seu bella geram: tibi maxima rerum
Verborumque fides.

ENT. Come, I'll have nothing said against the Society, underhand: it is going down; I was at the meeting on Monday; there were not a dozen members present, and half of those wore visages I had never seen before; I went with Marshall, one of the good old school.

ERRO. I once hoped that the Entomological Society would have been the means of uniting entomologists into one body, and called forth kindlier feelings among us. I looked for

bread and discovered a stone; I sought for Antirrhodus and I found Scylla; I expected an isle of gardens, and I beheld a barren and dangerous rock: "it is as the mist of the valley in the desert, seen afar off by some thirsty traveller, and when he cometh thereto, he findeth nothing to drink." Had I the means, I would leave England for a few years, and bury myself in the woods of America, in the hope that, when I returned, I should find that entomologists had recovered their senses. Oh, America!

ENT. I am firmly persuaded, from what I see of the working members of its council, that the Entomological Society will retard, not advance, entomology. How differently I thought, how differently I spoke, nine months ago!

ERRO. "Totum per annum est aer instar aeris verni; ubivis sunt floridi campi, montes sylvescentes, rivi perennes, cœlum hilaritate et lætitia plenum."

ENT. My dear friend, on this subject, you may surely speak the vernacular.

ERRO. Palmarum feracissima regio, cœlo sereno. Nihil quietius, nihil muscosius, nihil amœnius.

ENT. Oh, envy! envy!

ERRO. How singular it is to see envy for ever watching the opportunity to transfer merit from one to another, thus endeavouring to diminish the actual amount.

ENT. Yet talk not of leaving us; there *are* good spirits, though very, very few, who have not turned their backs on the cause of truth.

ERRO. I may not go; yet life is to me of little value, now that its darling hope is crossed; I could say with Gray, whilst regarding the setting sun—

O! ego felix, vice si nec unquam
Surgerem rursus, simili cadentem
Parca me lenis sineret quieto
Tollere leto.

Fame, once my load-star, now no longer leads me.

Donec eram sospes tituli tangebar amore,
Quærendique mihi nominis ardor erat.

ENT. Roey, you mistake. A ruling passion never yields its sway, and the love of fame is with you a ruling passion; the possession to satiety could alone smother it. Say not that fame no longer leads, no longer influences: does a man who

is not in love prate of his *Dulcinea*? Our bosoms beat not with the hopes of our fathers, neither will those of our children echo the throbbings of our own; yet each individual bosom is ever faithful to its own aspirations. What do you think of when alone? for that is the test. Sweet is the smile that succeeds to weeping; sweet is the sun-gleam following a shower; sweet is the song of the nightingale at moonlit midnight; sweet, very sweet, is the voice of those we love; but sweeter by far is that perfectly uninterrupted solitude when we sit the centre of a halo of thought, when the mind asserts its empire, proclaims its power, and, unfettered, dashes onwards whithersoever it will. Fame, Roey, is your happiness, even though at present principally prospective; but, on that ground, none the less supreme; for, let me tell you, a principal character of happiness is stability, and that is the most unsullied which casts into futurity the longest shadow; whereas, unaccompanied by the idea of stability, all happiness, though obvious, sunny, and glaring, like the great pyramid at noon, is unsatisfactory, because, like that also, shadowless. Talk not to me of disappointed hopes; talk not to me of mankind, as though your knowledge of them was a painful and afflicting burden. Would you, I ask, unknow all that you know of man, just to believe the world better than it is? If there were placed within your reach a cup of the waters of *Lethe* that would instantly wash away all traces that good and evil had for a series of years impressed, and leave the mind a perfect vacuum, would you drink it? No! I answer for you, for I know you better than you know yourself. Let me once more entreat you to indulge less in idle speculation and morbid thought; you, who might astonish the world, are wasting your hours, days, and years, while you see—

ERRO.—

When cold in the earth lies the friend thou hast loved,
 Be his faults and his follies forgot by thee then,
 Or if, from their slumber, the veil be removed,
 Weep o'er them in silence and close it again.
 But, oh! if 'tis pain to remember how far
 From the pathways of light he was tempted to roam,
 Be it bliss to remember, that thou wast the star
 That arose on his darkness and guided him home.

ENT. How beautiful! alas! I have no such power.

ERRO. Moore's versification is exquisite; it has a charm that seems almost mysterious; in what consists the sweet flow of his lines? I wish I was not so fond of poetry; I love it with enthusiasm; yet, to please you, I will give it up, and make up my mind to follow severer studies;—

Ite hinc, Camænæ, voce mellite divæ
Dulces Camænæ, nam fatebimur verum
Dulces fuistis; sed tamen meas chartas
Revisitote sed pudenter et raro.

So says old Virgil, and thereto I say, amen! I mean, some day or other, to be able to say—

Jamque opus exegi: quod nec Jovis ira, nec ignes,
Nec poterit ferrum, nec edax abolere vetustas,
Cum volet illa dies, quæ nil nisi corporis hujus
Jus habet, incerti spatium mihi finiat ævi.
Parte tamen meliore mei super alta perennis
Astra ferar: nomenque erit indelibile nostrum.

That would please even you, "my guide, philosopher, and friend."

ENT. Do you recollect, in this very room, two years ago this autumn, calling my "Sphinx" a monument, or something like that? Well, when my uncle was in America, he called on Thomas Say.

ERRO. Indeed! I should call that a "non sequitur."

ENT. Um! should you; I tell you it's a positive truth. My uncle was much delighted with Say; he was dressed in the homeliest manner, and appeared to be living in a state of patriarchal simplicity, but full of information, and his heart overflowing with boundless benevolence; and he was reading—guess what.

ERRO. Mrs. Trollope, I guess, or Malthus?—Adam Smith?—Hogg, on Sheep?—I give it up then.

ENT. "Sphinx Vespiformis;" he was pondering over the musings of your friend.

ERRO. Capital. I had long been bent on discovering the system of nature, when I saw your system first on paper, and I immediately exclaimed *ευρηκα*; as I have gone somewhat more minutely into detail, I have had occasional misgivings as to parts, but nothing affecting the main theory, especially the centrality of groups. I am inclined to think that we at present know so little of nature that we cannot make a very

near approach to truth; but we may gather, here and there, some scattered rays which may help us in our search: did we possess a knowledge of the major parts of the productions of nature, we might possibly, by paying strict attention to internal as well as external conformation, and by placing together species, genera, and higher divisions, whenever we detected a relationship, thus covering some immense place with the objects themselves, and having them all under view at once, we might possibly make a near approach to, if not actually discover, the true natural position of each and all. How delicious to the theorist, to see creation thus arrayed, like a huge army, before him. I think I have said, somewhere, that that system is the most natural which preserves the most affinities, and breaks the fewest.

ENT. Were it not still better to arrange them before the mental eye; that eye, whose gaze stops not with space, whose vision is uninterrupted by material grossness. Often, often the waking dreams of the night-watches of my childhood have presented to my imagination the picture you describe; and now, now creation spreads itself before me, and each being that lives, each being that I have seen, or heard of, or read of, or thought of, or dreamt of, assimilates with its kind and assumes its appointed place: all is harmonious and glorious order; and the mind gazes in exstasy, till, inebriated with thoughts of delight, it dances before the phantom it has raised.

ERRO. I believe it.

ENT. "*Sphinx Vespiformis*" gained me much ill-will.

ERRO. To be sure it did; it set so completely at defiance the quackery of the day; "and," says Bacon, "all men oppose with intense hatred him who first proposes an important alteration or evident improvement, because the very act implies that they have been previously in blind error; and, moreover, the sudden unexpected appearance of such a work conveys to them the humiliating assurance that the author has not considered the knowing ones worth consulting on the subject. Genius has thus ever engendered envy and dislike among the minors, and has consequently been always, in some degree, a bar to fame. Let in the light upon a nest of young owls, and they forthwith cry out against the injury you have done them. Men of mediocrity are young owls; when you present them with strong and brilliant ideas, they instantly

exclaim against them as false, dangerous, and deserving of punishment. Every abuse attempted to be reformed is the patrimony of those who have more influence than the reformers. He who would be great must go alone; he must not stop to curry favour here and there with every commentator. The hope to please all is the diseased yearning of a cold, selfish, and contracted heart."

ENT. *Does Bacon say all that?*

ERRO. I won't be certain that the passage is entirely Bacon's, but I think you will find some of the ideas in his works.

ENT. Roey! why always use the language of others?

ERRO. Because it is less trouble to employ the words of others, than to fit expressions to my own ideas; and because I can think nothing, express nothing, that has not before been thought and expressed far more beautifully: but I mean to copy you, in being original. [? Ed.] I feel that, as the flame of that candle rises to the cigar which you are holding over it, so does my soul grow upwards to the stature you wish it to attain.

ENT. Change the subject, Roey, my heart is overflowing. How truly it is said, that the heart is ever ready to open to the heart that opens in return!

ERRO. Changed it is. You are wrong in the honey-bee paper, which you wrote for me, in saying, that our love of nature is less intense when the other love is gone. I once thought as you say, but I don't now. Love, commonly so called, is a meteor's light; the love of nature is like the light of a

Polar day, which will not see
A sunset till its summer's gone:

it is a flame, only dying with our reason; the other only lives till our reason awakes, and tells us that what we love in another is only the fancied image of our own mind:—

Of its own image is the mind diseased.

I love nature more and more, man less and less; yet I do love mankind, though I would rather live in a desert than with the common run of men. Oh! I can recollect with intense pleasure the scenes we visited together in Wales, when, as

you say (quizzing me, I know), that the stored-up treasures of by-gone ages overflowed in a tumult of quotation: and it is true; the scenery called it forth; yes! I remember those scenes with more intense pleasure than when I witnessed them. Oh! that I were now on Snowdon's shaggy side, with one friend to whom I could whisper, "solitude is sweet."

ENT. Should you live until you have a beard on your face, your Platonic discourses will be very fine, about outliving love, and so forth; at present, they appear rather out of joint with time. What other criticisms have you for me? what other errors have you found?

ERRO. I have enough to do to criticise others, without finding fault with my contributors, and in *that* I can't give satisfaction; Swainson and W. Christy have both been written to by James Wilson, about his *Entomologia Edinensis*. Now, it's brother John, the magnifico, the Christopher North of Blackwood's Magazine, that I'm afraid of; if we offend him, he will annihilate us with his knout. What shall I do? I'd make any apology.

ENT. I should have thought you had had enough experience in making apologies already.

ERRO. True; I don't excel, I believe, in that species of composition.

ENT. People who excel in apologies excel in nothing else.

ERRO. I am heartily tired of the editorship. My first number cost me fourteen pounds in weight; my second eight pounds; and my Midsummer number fifteen pounds; before the volume is complete, I shall be a second living skeleton. I knew myself to be unfit from the first. "*Mea semper fuit in hac re voluntas et sententia; quemvis ut hoc mallet de iis qui essent idonei suscipere quam me; me ut mallet quem neminem.*" I wish you had kept it.

ENT. Thank you, very cordially; but I do not feel sufficiently Quixotic to take the helm of the Fire-fly at the present crisis; besides, it's too much trouble, this hot weather, to contend with the malcontents. I'll take my copies, but no more trouble.

ERRO. But, about Wilson.

ENT. Be under no alarm about that: a regular scarifying from North would be an advertisement; he hawks not at ignoble game; lions prey not on mice; if Christopher do

throw down the gauntlet to you, it will be a proof that he considers you no unworthy foe; and as you, Roey, are a man of peace, you will confer an everlasting obligation on me by allowing me to take it up.

ERRO. You must be Editor again, next year.

ENT. Not I! The most suitable man in the club is my friend, Entex. I understand all eyes are turned to him for the third volume.

ERRO. Our entomological papa: that's good news!

ENT. It's a most profound secret; he would not have it known for the world. His other work is to be quarterly now.

ERRO. But I may have judged too hastily of the Entomologia Edinensis; it is really a work of some—some—

ENT. Some what?

ERRO. Some industry.

ENT. Pooh! My cigar is out.

ERRO. I should think, from the pile of ashes before you, that must be the twentieth, at least, since supper; is it the last? it must be growing late.

ENT. The passage of time is voiceless and imperceptible; the hours usually pass briskly when we meet at this enchanted spot. Suppose we take a draught of purer air, and then to bed. (*Goes to the window, and opens it.*) Mercy on us, it is daylight still!

ERRO. What, what! is it evening still? No!

Hâc vice sermonum roseis Aurora quadrigis
Jam medium æthereo cursu trajecerat axem.

ENT. What a sky, Roey! ten thousand times ten thousand fleecy clouds, the sunward edge of each irradiate with rosy light, and all in squadron formed; scattered and separate each from each above our heads; but clouded and huddled at the horizon, and there more glorious than molten gold, and arranged all in due order; avenues of purest blue immaculate mark out the limits of each legion; avenues all tending to a point, that point the coming sun. Man is, indeed, a worm!

ERRO.—

Aurora interea miseris mortalibus almam
Extulerat lucem, referens opera atque labores.

Let us, then, to the woods, and renew *our* toil.

ENT. To-morrow, Roey, by steam to Edinburgh ; but let us stay here as long as we can, and now—

Hie away! to the woods, hie away!

Aurora with crimson has tinted the sky,
And the blithe lark, the herald of day,
Is pouring his music around from on high.
Hie away! to the woods, hie away!

Hie away! to the woods, hie away!

Field, flower, and forest, all glitter with dew,
And there droops, on its elegant spray,
The harebell, arrayed in its beautiful blue.
Hie away! to the woods, hie away!

It is not the first time that we have made a door of this window.

ERRO. And the other doors will be fastened now. (*He takes up the nets.*)

Et jam prima novo spargebat lumine terras
Tithoni croceum linquens Aurora cubile:
Jam sole infuso, jam rebus luce retutis
Turnus in arma viros, armis circumdatus ipse
Suscitat.

(*Exeunt through the open window.*)

ART. XXXIII.—*Monographia Chalciditum*. By FRANCIS WALKER.

(*Continued from p. 309.*)

“ ——— the green myriads in the peopled grass.”

GENUS VIII.—PLATYTERMA.

Sp. 7. *Plat. incultum*. Mas. *P. prasini statura, antennis fuscis, alis subhyalinis.*

Viride: oculi ocellique rufo-fusci: antennæ pallidè fuscae, corporis dimidio longiores, subtus fulvæ; articulus 1^{us}. lætè flavus; clava obscurè fusca: abdomen thorace paullo longius; discus obscurè cupreus: sexualia fusca: pedes lætè flavi; coxæ virides; tarsi apice fusci; protarsi fulvi: alæ subhyalinæ; squamulæ et nervi flava; stigma pallidè fuscum, minutum. (Corp. long. $\frac{5}{4}$ lin.; alar. $1\frac{1}{4}$ lin.)

September; near the Land's End, Cornwall.

Sp. 8. Plat. comptum. Fem. P. terminali *simile*, caput et abdomen *lattera*, antennæ *obscuriores*.

Lætè æneo-viride: caput thorace latius: oculi ocellique rufo-fusci: antennæ fuscae, corporis dimidii longitudine; articulus 1^{us}. basi flavus: metathorax viridis: abdomen viride, elongato-ovatum, thorace paullo longius et latius, subtus non angulatum; discus cupreo-æneus: pedes pallidè flavi; coxæ virides; tarsi apice fusci; protarsi flavi: alæ hyalinæ; squamulæ et nervi pallidè flava; stigma minutum. (Corp. long. 1 lin.; alar. 1½ lin.)

July; on grass in fields; near London.

Sp. 9. Plat. femorale. Mas et Fem. *Viride*, antennis *fulvis apice fuscis* (mas) *aut fuscis* (fem.), *pedibus flavis*, fem. *femoribus viridibus*, *alis hyalinis*.

Mas.—Lætè viride: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidii longitudine; articulus 1^{us}. flavus; 2^{us}. supra et clava fusca: abdomen æneo-viride, nitens: sexualia fulva: pedes lætè flavi; coxæ virides; tarsi apice fusci; protarsi fulvi: alæ hyalinæ, paullo flavescentes; squamulæ et nervi flava; stigma minutum.

Fem.—Viride: antennæ fuscae; articulus 1^{us}. fulvus; 2^{us}. viridis, apice fuscus: abdomen lætè viride, thorace vix longius, subtus non angulatum; segmenta apice cuprea: femora viridia, apice flava; meso- et metatarsi apice nigro-fusci: alæ fulvescentes; squamulæ et nervi fulva; stigma pallidè fuscum, minutum. (Corp. long. ½—1 lin.; alar. ½—1½ lin.)

Var. β.—Mas, antennæ articulis 11^o. basi et 13^o. apice fulvis.

Var. γ.—Mas, caput cyaneo-viride.

Var. δ.—Mas, antennæ clava fulva.

Var. ε.—Mas, abdomen viride.

Var. ζ.—Mas, abdomen viride; discus cupreo-viridis.

Var. η.—Mas, cyaneo-viride: abdominis discus æneo-viridis.

Var. θ.—Mas, abdominis discus cupreus.

Var. ι.—Mas, caput et thorax cyaneo-viridia, illum inter oculos et hujus scutum posticè æneo-viridia; abdomen viride; discus cupreus.

Var. κ.—Fem. antennæ articulo 1^o. supra fusco.

Var. λ.—Fem. antennæ articulo 2^o. viridi-fusco.

Var. μ.—Fem. antennæ articulo 1^o. supra viridi-fusco.

Var. ν.—Fem. abdominis discus cupreo-æneus.

Var. ξ.—Fem. abdominis segmenta apice cyaneo-cuprea.

Var. ο.—Fem. femora et tibiæ fulva;

Var. π.—*Fem.* abdomen cupreo-æneum, basi apice que viride; segmenta nonnulla basi cyanea: alæ vix fulvescentes.

Var. ρ.—*Fem.* alæ omninò perlucidæ.

Var. σ.—*Fem.* thoracis dorsum æneo-viride: stigma fuscum.

Var. τ.—*Fem.* thoracis latera, abdomen subtus et femora æneo-viridia.

April to September; on grass in fields; near London. June; Windsor. June and September; Isle of Wight. September; Westmoreland and Cumberland; Penzance, Cornwall. New Lanark, Scotland.

Sp. 10. Plat. decorum. Mas et Fem. *Viride, abdomine purpureo, antennis fulvis (mas) aut fuscis (fem.), pedibus flavis, alis griseo-hyalinis.*

Mas.—Lætè aureo-viride: caput thorace vix latius: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidio paullò breviores; articulus 1^{us}. lætè flavus, apice fulvus; 2^{us}. basi pallidè fuscus; clava obscurè fusca, apice pallidior, articulo 10^o. paullò latior: caput anticè mesothoracisque scutellum apice viridia: abdomen thorace paullò longius, basi cupreo-viride; discus splendidè cupreo-purpureus: sexualia pallidè fusca: pedes lætè flavi; coxæ virides; tarsi apice fusci; protibiæ et protarsi fulva; alæ griseo-hyalinæ; squamulæ flavæ; nervi fusci; stigma minutum.

Fem.—Obscurè viride: antennæ fulvo-fuscæ, corporis dimidio multò breviores; articulus 1^{us}. fulvus; 2^{us}. fuscus: abdomen obscurè purpureum, thorace multò longius et paullò angustius, basi lætè cupreo-viride, subtus æneo-viride angulatum, apice concolor attenuatum acuminatum pubescens. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. $1\frac{1}{2}$ — $1\frac{5}{4}$ lin.)

July and August; on oak trees; near London.

Sp. 11. Plat. remotum. Fem. *Præcedentibus latius et brevius.*

Lætè viride: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidii longitudine; articulus 1^{us}. pallidior; clava obscurior: parapsidum suturæ æneo-virides: abdomen obscurè cupreo-æneum, thoracis longitudine et latitudine, basi lætè viride, subtus angulatum, apice acuminatum; segmenta basi viridi-ænea: pedes lætè flavi; coxæ virides; femora basi, meso- et metatibiæ medio pallidè fusca: tarsi apice fusci: protibiæ et protarsi fulva: alæ hyalinæ, minimè sub costam flaves-

centes; squamulæ et nervi flava; stigma minutum. (Corp. long. $\frac{4}{5}$ lin.; alar. $1\frac{1}{2}$ lin.)

July; on grass in fields; near London.

GENUS IX.—AMBLYMERUS.

Sp. 4. Amb. ruralis. Fem. A. valido *paullò minor et angustior; alæ obscuriores.*

Æneo-viridis: caput viride, thorace paullò latius: oculi ocellique rufo-fusci: antennæ fuscæ; articulus 1^{us}. flavus: abdomen obscurè cupreum, thorace paullò longius, subtus angulatum; segmentorum margines basi et utrinque lætè virides: oviductus pallidè rufus, abdominis apicem non transiens: pedes pallidè fulvi; coxæ æneo-virides; genua, tibiæ apice tarsique pallidè flava, hi apice fusci; protarsi flavi: alæ subfulvæ; squamulæ et nervi fulva; stigma minutum. (Corp. long. $\frac{3}{4}$ —1 lin.; alar. $1—1\frac{1}{4}$ lin.)

Var. β.—Antennæ articulo 1^o. fusco, basi subtusque flavo.

Var. γ.—Abdomen ferè omne nigro-cupreum; segmentum 1^{um}. basi lætè viride.

August; on grass beneath trees; near London. September; Isle of Wight; New Lanark, Scotland.

Sp. 5. Amb. campestris. Fem. *Præcedenti similis, paullò brevior; clava angustior et acutior.*

Æneo-viridis, vix nitens: caput viride, thorace paullò latius: oculi ocellique rufo-fusci: antennæ fuscæ; articulus 1^{us}. flavo-fulvus, basi flavus: abdomen nigro-cupreum, thorace vix longius, subtus non angulatum; segmenta basi lætè viridia: pedes fulvi; coxæ æneo-virides; protibiæ pallidè fulvæ, subtus flavæ; tarsi apice fulvi; meso- et metatarsi straminei: alæ subfulvæ; squamulæ et nervi fulva; stigma parvum. (Corp. long. $\frac{1}{2}$ lin.; alar. $\frac{3}{4}$ lin.)

Var. β.—Protibiæ omninò flavæ: meso- et metapedum genua tibiæque apice straminea.

August; on grass in fields; near London.

Sp. 6. Amb. latus. Fem. *Viridis, A. dubii statura, clava angustiore, antennis fuscis, pedibus flavis, alis subhyalinis.*

Viridis: caput thoracis latitudine: oculi ocellique rufi: antennæ obscurè fuscæ; clava pallidior; articulus 1^{us}. fulvus: abdomen

thorace paullò longius, subtus non angulatum; discus nigro-æneus; segmenta 2^o. ad 4^{um}. cyaneo cingulata: pedes lætè flavi: coxæ virides; meso- et metatarsi straminei, apice fuscì; protarsi apice fulvi: alæ subhyalinæ, vix flavescentes; squamulæ fuscæ; nervi flavi; stigma parvum. (Corp. long. 1 lin.; alar. 1½ lin.)

September; Isle of Wight.

Sp. 7. Amb. truncatellus. Fem. *Æneo-viridis, præcedentibus multò brevior, antennis obscure fuscis, pedibus flavis, alis hyalinis.*

Æneo-viridis: caput thorace paullò latius: antennæ obscure fuscæ, corporis dimidio vix longiores; clava pallidior; articulus 1^{us}. basi flavus: oculi ocellique fusco-rufi: abdomen viride, basi nitentius et cupreo variegatum, thorace paullò angustius vix longius, subtus angulatum; discus æneus: pedes flavi; coxæ æneo-virides; metafemora extus et mesotibiæ intus fulva; meso- et metatarsi straminei, apice fuscì; protarsi apice fulvi: alæ hyalinæ; squamulæ et nervi flava; stigma minutum. (Corp. long. ½ lin.; alar. ¾ lin.)

July; on grass in fields; near London.

Sp. 8. Amb. fulvipennis. Fem. *Cupreo-æneus, ferè A. validi statura, antennis fuscis, pedibus fulvis, alis fulvis.*

Cupreo-æneus: caput viridi-æneum, thorace paullò latius: oculi ocellique rufo-fuscì: antennæ obscure fuscæ, corporis dimidio vix breviores; articulus 1^{us}. fulvus: abdomen cupreum, breve, latum, thoracis longitudine, subtus angulatum; discus obscurior: pedes fulvi; coxæ cupreo-æneæ; meso- et metatarsi flavi, apice fuscì: alæ fulvæ; squamulæ et nervi fusca; stigma minutum. (Corp. long. 1 lin.; alar. 1½ lin.)

Var. β.—Abdomen basi viridi-æneum: tibiæ apice basique flavæ: squamulæ et nervi pallidè fusca.

June; on grass beneath trees; near London; New Forest, Hampshire.

Sp. 9. Amb. modestus. Fem. *Viridis, præcedentis ferè statura sed minor, antennis nigro-fuscis, abdomine plerumque æneo, pedibus fulvis, alis fuscis.*

Obscurè viridis: caput thorace latius: oculi ocellique rufo-fuscì: antennæ nigro-fuscæ, crassæ, corporis dimidio breviores; articulus

1^{us}. fulvus: abdomen viridi-æneum, thorace non longius sed multò latius, subtus non angulatum, basi nitentius: oviductus rufus: pedes fulvi; coxæ virides; femora fusca, apice fulva; meso- et metatarsi flavi, apice fusci: alæ fuscæ; squamulæ et nervi fulvo-fusca; stigma parvum. (Corp. long. $\frac{1}{2}$ — $\frac{5}{4}$ lin.; alar. $\frac{3}{4}$ —1 lin.)

Var. β.—Antennæ fuscæ; articulus 1^{us}. fulvus, apice fuscus.

Var. γ.—Antennæ subnigræ; articulus 1^{us}. obscurè fuscus, basi fulvus.

Var. δ.—Antennæ articulo 1^o. omninò fusco.

Var. ε.—Antennæ articulo 1^o. apice fusco: abdomen nigro-viride, basi æneo-viride nitentius.

Var. ζ.—Antennæ articulo 1^o. fulvo-fusco: abdomen viride; discus nigro-viridis: pedes flavi; femora fulva; meso- et metatarsi straminei, apice fusci: alæ subfuscæ.

Var. η.—Antennæ articulo 1^o. fusco, basi fulvo: abdomen obscurè æneo-viride; discus cyaneo-cupreus: alæ subfuscæ.

Var. θ.—Abdomen cupreo-æneum, basi viride nitentius, apice æneo-viride.

Var. ι.—Abdomen nigro-æneum, basi æneo-viride nitentius: femora omninò fulva.

Var. κ.—Abdomen basi æneo-viride: femora fulva; protibiæ et protarsi flava.

Var. λ.—Cyaneo-viridis: abdomen obscurè viridi-cyaneum, basi æneo-viride.

Var. μ.—*Var. λ* similis: femora fulva: alæ subfuscæ.

Var. ν.—Antennæ articulo 1^o. flavo: protibiæ et protarsi flava: abdomen æneo-viride, basi viride: femora fulva.

Var. ξ.—Abdomen nigro-æneum, basi apiceque viride: femora fulva; protibiæ et protarsi flava: alæ fuscæ; discus obscurior.

Var. ο.—Obscurè viridi-æneus: abdomen nigro-æneum, basi apiceque æneo-viride: femora fulva.

Var. π.—Abdominis segmenta basi nigro-cyanea: femora fulva; alæ subfuscæ.

Var. ρ.—Antennæ fuscæ; articulus 1^{us}. apice fuscus: abdomen viride; discus cyaneo-cupreus: pedes flavi; meso- et metatarsi straminei, apice fusci: alæ subhyalinæ.

Var. σ.—Æneo-viridis: antennæ nigræ; articulus 1^{us}. nigro-fuscus, basi fulvus: abdominis segmenta apice nigro-cyanea: pedes fusci; tarsi flavi, apice fusci; genua et protarsi fulva: alæ subfuscæ.

August; on grass in fields; near London. September; Isle of Wight; Westmoreland and Cumberland; Land's End, Cornwall; New Lanark, Scotland.

- Sp. 10. Amb. fuscipes. Fem. *Viridi-æneus*, A. amoeni *statura, abdomine cupreo-æneo, antennis pedibusque fuscis, alis fulvescentibus.*

Viridi-æneus: caput viride, thorace latius: oculi ocellique rufo-fusci: antennæ fuscæ, sat crassæ, corporis dimidio vix breviores; articulus 1^{us}. obscurè fuscus, basi pallidior: abdomen purpureo-æneum, thorace paullò longius vix latius, apice basique æneo-viride, subtus angulatum et apice minimè elevatum; segmenta basi viridia: pedes obscurè fuscii; coxæ virides; mesofemora subtus apice spina armata; genua fulva; protarsi fuscii; meso- et metatarsi pallidè flavi, apice fuscii: alæ subhyalinæ, amplæ, sub nervum fulvæ; squamulæ fuscæ; nervi fulvi; stigma parvum. (Corp. long. 1 lin.; alar 1 $\frac{3}{4}$ lin.)

Var. β.—Caput supra æneum: thorax et abdomen cupreo-ænea, hujus discus cyaneo-purpureus: protarsi fulvi, apice fuscii.

June; on grass in woods; near London.

- Sp. 11. Amb. humilis. Fem. *Viridi-æneus, præcedenti similis, antennis pedibusque fuscis, femoribus viridibus, abdomine cupreo, alis subflavescentibus.*

Æneus: caput æneo-viride: oculi ocellique rufo-fusci: antennæ fuscæ; articulus 1^{us}. obscurior, basi fulvo-fuscus: abdomen obscurè cupreum, basi et subtus æneo-viride nitentius; segmenta basi viridia: pedes fuscii; coxæ et femora viridia; protibiæ pallidè fuscæ; genua et protarsi fulva; meso- et metatarsi flavi, apice fuscii: alæ hyalinæ, sub costam flavescentes; squamulæ et nervi fulva; stigma obscurius, parvum. Corp. long. $\frac{4}{5}$ lin.; alar. 1 $\frac{1}{2}$ lin.)

June; New Forest, Hampshire.

- Sp. 12. Amb. albitarsus. Fem. *Viridi-cyaneus*, A. fuscipedis *statura, abdomine purpureo, antennis pedibusque fuscis, alis hyalinis.*

Viridi-cyaneus: caput thorace latius: oculi ocellique rufo-fusci: antennæ fuscæ, graciles, corporis dimidii longitudine: abdomen purpureum, thorace longius et angustius, apice obscurè basi lætè viride, subtus non angulatum: metathorax lætè viridis: pedes nigro-fuscii; coxæ virides; genua, tibiæ apice tarsique alba, hi apice nigro-fuscii; propedum genua flava, tibiæ tarsique pallidè fusca: alæ hyalinæ, latæ; squamulæ fuscæ; nervi fulvi; stigma parvum. (Corp. long. 1 lin.; alar. 1 $\frac{1}{2}$ lin.)

August; on grass beneath trees; near London.

Sp. 13. Amb. nitescens. Fem. *Viridi-æneus*, A. amœni *statura, abdomine purpureo-æneo, antennis pedibusque nigro-fuscis, alis subfuscis.*

Æneus: caput thorace latius, anticè viride: oculi ocellique rufo-fusci: antennæ nigro-fuscae, corporis dimidio paullò longiores; articulus 1^{us}. fuscus, basi fulvus: metathorax æneo-viridis: abdomen viride, thorace longius, subtus non angulatum; discus purpureo-æneus; segmenta basi viridia: coxæ virides; trochanteres fulvi; femora nigro-viridia; tibiæ nigræ, apice basique flavæ; protibiæ et protarsi fusca, illæ extus nigræ; meso- et metatarsi flavi, apice fusci; alæ subfuscae, prope costam obscuriores; squamulæ et nervi fusca; stigma mediocre, nigrum. (Corp. long. $1\frac{1}{2}$ lin.; alar. $2\frac{1}{2}$ lin.)

August; on grass under trees; near London.

Sp. 14. Amb. pusillus. Fem. *Æneo-viridis, præcedentibus angustior, A. dubio similis at minor, antennis fuscis, pedibus flavis, alis subhyalinis.*

Æneo-viridis: caput thorace paullò latius: oculi ocellique fusco-rufi: antennæ fuscae, corporis dimidii longitudine; articulus 1^{us}. basi flavus: scutellum viridi-æneum: abdomen thorace longius, subtus non angulatum; discus cupreo-æneus: pedes flavi; coxæ æneo-virides; tarsi apice fusci: alæ subhyalinæ, minimè flavescens; squamulæ fulvæ; nervi flavi; stigma minutum. (Corp. long. $\frac{1}{2}$ — $\frac{2}{3}$ lin.; alar. $\frac{3}{4}$ —1 lin.)

Var. β.—Caput viride.

Var. γ.—Viridis: prothorax æneo-viridis: abdominis discus cupreo-æneus.

September; Isle of Wight.

Sp. 15. Amb. tenuicornis. Fem. A. pusillo *similis, antennis gracilioribus, abdomine longiore et angustiore.*

Æneo-viridis: caput anticè viride, thoracis latitudine: oculi ocellique rufo-fusci: antennæ fuscae, corporis dimidii longitudine, hujus generis plerisque graciliores clava angustiore et acutiore; articulus 1^{us}. basi flavus: abdomen viride, thorace longius, subtus paullò carinatum; segmenta 2^o. ad 5^{um}. nisi ad apices nigro-ænea: pedes flavi; coxæ æneo-virides; tarsi apice pallidè fusci: alæ hyalinæ; squamulæ et nervi flava; stigma minimum, vix conspicuum. (Corp. long. $\frac{2}{3}$ lin.; alar. $\frac{3}{4}$ lin.)

July; on grass in fields; near London.

Sp. 16. Amb. hebes. Fem. *Viridis*, A. *modesti statura*, *præcedentibus plerisque crassior*, *antennis fuscis*, *abdomine æneo*, *pedibus fulvis*, *alis hyalinis*.

Viridis: caput thorace vix latius: oculi ocellique fusci: antennæ obscurè fuscæ, crassæ, corporis dimidii longitudine; articulus 1^{us}. flavus, apice fulvus: scutellum æneo-viride: abdomen thorace vix longius, subtus non angulatum, medio cupreo-æneum parùm nitens, basi æneum nitentius: pedes fulvi; coxæ æneo-virides; tarsi flavi, apice fusci: alæ hyalinæ; squamulæ et nervi fusca; stigma minutum. (Corp. long. $\frac{3}{4}$ lin.; alar. 1 lin.)

August; on grass in fields; near London.

Sp. 17. Amb. tenellus. Fem. A. *pusillo similis sed paullo longior et angustior*.

Viridis: caput thorace vix latius: oculi ocellique fusco-rufi: antennæ fuscæ, corporis dimidio breviores; articulus 1^{us}. basi flavus: abdomen thorace multò longius, subtus non angulatum; discus cupreo-æneus: pedes flavi; coxæ virides; tarsi pallidè flavi, apice fusci: alæ subhyalinæ; squamulæ et nervi fulva; stigma parvum. (Corp. long. $\frac{2}{3}$ lin.; alar. $\frac{3}{4}$ lin.)

September; Isle of Wight.

Sp. 18. Amb. fulvipes. Fem. *Præcedenti similis*, *clava latiore*, *abdomine subtus angulato*.

Viridis: caput thorace paullo latius: oculi ocellique rufi: antennæ pallidè fuscæ, corporis dimidio vix breviores; articulus 1^{us}. basi flavus; clava articulo 10°. multò latior: scutellum æneo-viride: abdomen æneo-viride, thorace paullo longius, subtus angulatum: pedes fulvi; coxæ virides; protibiæ et tarsi omnes flava, hi apice fusci: alæ subfulvæ; squamulæ et nervi fulva; stigma minutum. (Corp. long. $\frac{2}{3}$ lin.; alar. $\frac{3}{4}$ lin.)

September; Isle of Wight.

Sp. 19. Amb. stupidus. Fem. A. *lato similis sed paullo angustior*.

Viridis: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fuscæ, corporis dimidio breviores; articulus 1^{us}. basi flavus: abdomen æneo-viride, thorace longius, subtus angulatum: segmenta 2^o. ad 5^{um}. apice cupreo-ænea: pedes flavi; coxæ virides; femora viridia, apice basique flava; meso- et metatarsi pallidè

flavi; omnes apice fusci: alæ subhyalinæ, paullo flavescentes; squamulæ et nervi fulva; stigma parvum. (Corp. long. $\frac{2}{3}$ —1 lin.; alar. 1—1 $\frac{1}{2}$ lin.)

Var. β.—Tibiæ fulvæ.

Var. γ.—Thoracis dorsum æneo-viride: protarsi fulvi.

Var. δ.—Antennæ articulo 2^o. viridi-fusco.

Var. ε.—Caput, thorax, et femora viridi-ænea.

September; Isle of Wight.

Sp. 20. Amb. nanus. Fem. A truncatelli *ferè statura, paullo angustior.*

Viridis: caput supra cyaneo-viride, thorace paullo latius: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidii longitudine; articulus 1^{us}. basi flavus: abdomen viridi-æneum, thorace vix longius, subtus angulatum: pedes flavi; coxæ virides; femora et metatibiæ fusca; mesotibiæ fulvæ; meso- et metatarsi pallidè straminei, apice fusci: alæ hyalinæ; squamulæ et nervi pallidè fulva; stigma minutum. (Corp. long. $\frac{1}{2}$ lin.; alar. $\frac{3}{4}$ lin.)

July; on grass in fields; near London.

Sp. 21. Amb. linearis. Fem. A. tenuicornis *statura, antennis apice crassioribus, clava brevior et obtusior, alis subfulvescentibus.*

Viridi-æneus: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fuscae, corporis dimidio breviores; articulus 1^{us}. basi flavus: mesothoracis scutellum et scuti discus cupreo-ænea: abdomen æneum, thoracis longitudinem superans, subtus paullo angulatum, basi cupreo-æneum nitentius; discus nigro-æneus: pedes fulvi; coxæ viridi-æneæ; femora et tibiæ apice, meso- et metatarsi flava, hi apice fusci; protarsi apice obscurè fulvi: alæ subfulvæ, apice et posticè pallidiores; squamulæ et nervi pallidè fulva; stigma minutum. (Corp. long. $\frac{1}{2}$ — $\frac{2}{3}$ lin.; alar. $\frac{2}{3}$ — $\frac{3}{4}$ lin.)

Var. β.—Æneo-viridis: scutellum æneum: abdomen nigro-æneum, basi æneo-viride nitentius; segmenta basi et utrinque viridia: metafemora subfusca.

Var. γ.—Æneo-viridis: caput viride: abdominis discus cupreo-æneus.

September; on grass in fields; near London. Isle of Wight.

Sp. 22. Amb. temperatus. Fem. *Præcedenti similis, antennis paullo brevioribus et crassioribus, abdomine latiore.*

Viridis: caput thoracis latitudine: oculi ocellique rufi: antennæ fuscae, corporis dimidio breviores; articulus 1^{us}. fulvus, apice supra fuscus: abdomen nigro-æneum, thorace longius, subtus non angulatum, apice basique viride: pedes fulvi; coxæ virides; tarsi apice fusci; genua, meso- et metatarsi flava: alæ subhyalinæ, vix flavescences; squamulæ et nervi pallidè fulva: stigma minutum. (Corp. long. $\frac{2}{3}$ lin.; alar. $\frac{3}{4}$ lin.)

Var. β .—Æneo-viridis: abdomen nigro-æneum, apice basique æneo-viride.

July; on grass in fields; near London. September; Isle of Wight.

Sp. 23. Amb.iners. Fem. *Præcedenti similis sed latior, antennis brevioribus et crassioribus.*

Viridi-æneus: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fuscae, corporis dimidio breviores; articulus 1^{us}. flavus: abdomen nigro-æneum, thorace latius et paulò longius, basi apiceque viride, subtus non angulatum: pedes fulvi; coxæ æneo-virides; tarsi flavi, apice fusci: alæ fulvæ; squamulæ et nervi fulva; stigma parvum. (Corp. long. $\frac{1}{2}$ lin.; alar. $\frac{2}{3}$ lin.)

September; Isle of Wight.

Sp. 24. Amb. trossulus. Fem. *A. modesti statura, abdomine paullo brevior, antennis fulvis, alis hyalinis.*

Æneo-viridis: caput viride, thorace paulò latius: oculi ocellique rufo-fusci: antennæ fulvæ, crassæ, corporis dimidio longiores; articulus 1^{us}. flavus; 2^{us}. supra basi et clava pallidè fusca: abdomen obscure cupreum, thorace latius sed non longius, basi lætè viride, subtus non angulatum; segmenta apice viridi-ænea: pedes flavi; coxæ virides; meso- et metatarsi straminei, apice pallidè fusci: alæ hyalinæ, minimè flavescences; squamulæ pallidè fuscae; nervi flavi; stigma fulvum, parvum. (Corp. long. $\frac{2}{3}$ lin.; alar. $\frac{3}{4}$ lin.)

August; on grass in fields; near London.

Sp. 25. Amb. stenomerus. Fem. *A. tenuicorni similis, paullo brevior et gracilior, alis angustioribus.*

Viridis, angustus, sublinearis: caput thorace paulò latius: oculi ocellique rufosusci: antennæ pallidè fuscae, graciles, corporis dimidii vix longitudine; articulus 1^{us}. fulvus; clava articulo 10°. multò latior: scutellum et abdomen viridi-ænea; hoc thorace

paullò longius, subtus non angulatum: pedes pallidè fuscì; coxæ virides; protibiæ et tarsi omnes flava, hi apice fuscì: alæ subfusca, angustæ; squamulæ et nervi fulva; stigma minutum. (Corp. long. $\frac{2}{3}$ lin.; alar. $\frac{3}{4}$ lin.)

October; on grass beneath trees; near London.

Sp. 26. Amb. tenebricus. Fem. *A. nitescentis statura, obscurior, stigmatè majore.*

Viridi-æneus, obscurus, crassus: caput æneo-viride, thoracis latitudine: oculi ocellique fuscì: antennæ nigræ, crassæ, corporis dimidio paullò breviores; articulus 1^{us}. fuscus, basi fulvus: mesothoracis scutellum cupreo-æneum: abdomen obscurè cupreum, thorace brevius et paullò latius, subtus angulatum, basi cupreo-viride nitentius, apice elevatum: pedes nigro-fuscì; coxæ et femora viridi-ænea; trochanteres fuscì; genua fulva; tarsi articulo 1^o. fusco, basi pallidè flavo: alæ obscurè fusca; squamulæ fulvæ; nervi nigro-fuscì, metalis pallidiores; stigma nigrum, magnum. (Corp. long. $1\frac{1}{2}$ lin.; alar. 2 lin.)

October; on grass in fields; near London.

Sp. 27. Amb. mirus. Fem. *Viridiæneus, antennis nigris, abdomine basi pedibusque fulvis, oviductu exerto, alis hyalinis.*

Nigro-viridis, quasi productus, *Callimomi* similis: caput thorace paullò latius: oculi ocellique fuscì: trophi ferruginei: antennæ nigræ, crassæ, breves, corporis trientis longitudine; articuli 1^o. ad 5^{um}. fulvi, clava nigro-fusca, ferè rotunda: prothorax lætè viridis, macula supra cupreo-cyanea: thorax subtus viridi-cyaneus: abdomen cupreo-æneum, thorace paullò longius, subtus angulatum, basi fulvum, apice fuscum; latera æneo viridia: oviductus rufus, abdominis trientis longitudine; vaginæ nigro-fusca, pilosæ, apice pallidiores: pedes fulvi; coxæ cyaneæ, apice flavæ; femora extus pallidè fusca; trochanteres, genua, meso et metatarsi flava, hi apice fulvi: alæ hyalinæ angustæ; squamulæ et nervi fulva; stigma parvum. (Corp. long. $1\frac{1}{2}$ lin.; alar. $1\frac{3}{4}$ lin.)

August; on grass in fields; near London.

†† *Antennæ articulis 3^o. et 4^o. minimis, 5^o. mediocri.*

§ *Clava brevis, vix acuminata.*

<i>Mari mesotibiæ</i>	{	-intus dilatata	PLATYMESOPUS.
		-extus dilatata	MESOPOLOBUS.
		-simplices	EUTELUS.

GENUS X.—PLATYMESOPUS, *Westwood*.

Mas.—Caput mediocre, thorace paullo latius: antennæ clavatæ; articulus 1^{us}. validus, subfusiformis; 3^{us}. et 4^{us}. minimi; 5^{us}. 6^{us}. et 7^{us}. subæquales; 8^{us}. 9^{us}. et 10^{us}. gradatim latitudine crescentes; clava ovata, articulo 10^o. multo latior: mandibulæ 4-dentatæ, subquadratæ, vix arcuatæ, intus emarginatæ, subæquales; una dente externo mediocri acuminato, 2^o. obtusiore et multo minore, 3^o. et 4^o. minutis, hoc latiore et obtusiore; altera dentibus brevioribus, 3^o. et 4^o. minimis vix discretis aut conspicuis: maxillæ basi latæ, inde abruptè angustatæ, angulum utrinque extus fingentes, ad apices elongatæ acuminatæ; lacinia in lobum quæque intus producta; palpi 4-articulati, crassi, longitudine mediocri; articuli 1^{us}. et 2^{us}. breves; 3^{us}. et 4^{us}. magni, dilatati, hic ovatus, ille ferè rotundus: labium ^a angustum, sublineare, posticè conicum; ligula ^b parva, anticè quasi fissa; palpi 3-articulati, breves, crassi; articulus 2^{us}. brevissimus; 3^{us}. apice acuminatus: thorax ovatus: prothorax brevissimus: mesothoracis scutum et scutellum maxima; parapsidum suturæ vix conspicuæ; paraptera et epimera benè determinata: metathorax parvus, subtilissimè squameus: abdomen elongato ovatum, thorace angustius sed non longius; segmentum 1^{um}. magnum; sequentia brevia, subæqualia: sexualia exerta: pro- et metapedes simplices; mesopedum femora apices versus spina gracili subtus armata, tibiæ intus valde dilatatæ: alæ mediocres; nervus humeralis ulnari vix longior, setis armatus, ramulum rejiciens nullum; cubitalis radiali brevior, stigmate ramulum brevissimum emittente terminatum.

Fem.—Antennæ articulo 1^o. gracili, 5^o. et sequentibus ad 10^{um}. gradatim latitudine crescentes; clava articulo 10^o. paullo latior; palpi maxillares graciles, filiformes; articuli 1^o. ad 3^{um}. subæquales; 4^{us}. 2ⁱ. et 3ⁱ. longitudine: abdomen thorace paullo latius, subtus non angulatum, apice acuminatum: oviductus non exertus: mesopedum tibiæ simplices.

Sp. 1. *Platy. tibialis*. *Mas. Viridis, antennis fulvis apice nigris, abdomine cupreo, pedibus flavis, alis hyalinis.*
Fem. Viridi-æneus, cupreo variegatus, antennis pedibusque fuscis, alis subhyalinis.

^a The *mentum* of my former descriptions. Vide *Osteology of Insects*, by Mr. Newman, page 71 of this volume.

^b The *labium* of my former descriptions.

Platymesopus tibialis. *Westwood, Lond. and Edinb. Phil. Mag. Third Series. Vol. II. No. XII. p. 444.*

Mas.—Lætè viridis: oculi ocellique rufo-fusci: trophi flavi; maxillæ basi et mentum viridi-ænea: antennæ fulvæ, corporis dimidio longiores, vix pubescentes; articulus 1^{us}. lætè flavus, apice fulvus; 9^{us}. et 10^{us}. fusci; clava nigra: abdomen cupreum, basi apiceque viride nitentius, subtus æneo-cupreum pubescentius: sexualia fusca: pedes lætè flavi; coxæ virides; profemora basi extus ferruginea; mesofemora intus ferrugineo vittata, spina fusca armata; protibiæ extus ferrugineo et mesotibiæ intus fusco vittatæ, hæ rubro marginatæ puncto nigro pilis nigris ciliato terminatæ; tarsi pallidè fulvi, apice fusci: alæ hyalinæ; squamulæ flavæ; nervi fulvi, ubi costam attingunt pallidè fusci; stigma concolor, parvum.

Fem.—Caput viride: antennæ pallidè fuscæ, corporis dimidio vix longiores, apice obscuriores, basi fulvæ: thorax æneo-viridis, cupreo variegatus: mesothoracis scutellum purpureo-cupreum: metathorax viridis: abdomen æneo-cupreum; segmenta basi viridia: pedes fusci; coxa æneo-virides; femora et tibiæ apice tarsique pallidè flava, hi apice fusci; protibiæ et protarsi flava, illæ extus fulvæ: alæ subhyalinæ. (Corp. long. $\frac{1}{2}$ — $1\frac{1}{3}$ lin.; alar. $\frac{5}{4}$ —2 lin.)

Var. β.—*Mas*, caput supra et circum oculos æneo-viride: mesothoracis dorsum cupreo-viride; scutum anticè viride: metathorax æneo-viridis: abdomen apice basique æneo-viride.

Var. γ.—*Mas*, *Var. β.* similis: thorax viridis; mesothoracis scutum anticè cupreoæneum.

Var. δ.—*Mas*, abdomen purpureo-cupreum, basi apiceque æneo-cupreum.

Var. ε.—*Mas*, caput et thorax cyaneo-viridia.

Var. ζ.—*Mas*, abdomen purpureo-cupreum, basi æneo-viride.

Var. η.—*Mas*, antennæ articulo 1^o. omninò flavo.

Var. θ.—*Mas*, thorax anticè et utrinque viridicyaneus.

Var. ι.—*Mas*, caput supra, mesothoracis scutum anticè, epimera et paraptera cupreo-ænea: abdomen cupreum, basi æneo-viride.

Var. κ.—*Mas*, caput anticè cyaneo-viride: abdomen purpureo-cupreum, basi apiceque viride.

Var. λ.—*Mas*, caput supra æneo-viride.

Var. μ.—*Mas*, prothorax omninò et mesothorax anticè æneo-virides.

Var. ν.—*Mas*, antennæ articulo 9^o. fulvo: abdomen æneo-viride.

Var. ξ.—*Mas*, antennæ articulis 1°. ad 7^{um}. flavis, 8°. et 9°. fulvis, 10°. fusco.

Var. ο.—*Mas*, nervi omnes pallidè fulvi.

Var. π.—*Fem.* caput supra æneo-viride: protibiæ fuscæ.

Var. ρ.—*Fem.* antennæ obscurè fuscæ, basi pallidiores: thorax æneo-viridis; mesothoracis scutum cupreo-æneum.

Var. σ.—*Fem.* mesothoracis scutellum cupreo-æneum.

Var. τ.—*Fem.* metathorax æneo-viridis.

Var. υ.—*Fem.* femora fusco-viridia.

Var. φ.—*Fem.* mesothoracis scuti dorsum cyaneo-viridi maculatum.

Var. χ.—*Fem.* thorax æneo-viridis; mesothoracis scutellum ferè omne et scutum posticè cupreo-cyanea.

Var. ψ.—*Fem.* *Var. χ.* similis sed mesothoracis macula cuprea.

Var. ω.—*Fem.* abdominis segmentum 1^{um}. basi viride; 2^{um}. et sequentia basi ænea: alæ subflavescentes; stigma obscurè fuscum.

Var. αα.—*Fem.* thorax cupreo-æneus: abdominis segmenta basi viridi-ænea.

Var. ββ.—*Fem.* thorax æneo-viridis; metathorax viridis.

May and June; on grass in woods; near London. June; Windsor. New Forest, Hampshire. Isle of Wight.

GENUS XI.—MESOPOLOBUS, *Westwood*.

Mas.—Corpus angustum, sublineare: caput parvum, thoracis latitudine: antennæ subclavatæ; articulus 1^{us}. gracilis, sublinearis; 3^{us}. et 4^{us}. minimi; 5^{us}. et sequentes ad 10^{um}. subæquales, latitudine gradatim crescentes; clava ovata, articulo 10°. paullo latior: mandibula una 4-dentata, subquadrata, vix arcuata, intus emarginata; dens externus mediocris, 2^{us}. minor, ambo acuminati, 3^{us}. et 4^{us}. brevissimi, ille subacuminatus, hic latior obtusus; altera similis sed dentibus 3°. et 4°. vix discretis aut conspicuis: maxillæ basi latæ, ad apices angustæ et acuminatæ; quæque in lobum lacinia intus producta; palpi 3-articulati?, graciles, longitudine mediocri, articulus 1^{us}. cyathiformis, mediocris; 2^{us}. 1ⁱ. longitudine, basi crassior; 3^{us}. subfusiformis, 1°. et 2°. longior, ramulum intus prope basim longum gracilem emittens: labium angustum, basi conicum; ligula minuta, anticè quasi fissa; palpi 3-articulati, breves, crassi; articulus 2^{us}. brevissimus: thorax elongato-ovatus, angustus: prothorax brevissimus: mesothoracis scutum et scutellum maxima; parapsidium suturæ vix conspicuæ; paraptera et epimera magna: metathorax mediocris: abdomen sublineare, thorace paullo brevius et angustius, basi et apice

angustatum; segmentum 1^{um}. maximum; sequentia breviora; apicalia parva: pedes graciles; metacoxæ longiores; mesotibiæ apices versus in lobum extus productæ trigonum: alæ mediocres; nervus humeralis ulnari multò longior, ramulum rejiciens nullum; cubitalis radiali brevior; stigma ramulum brevem emittens.

Sp. 1. Mesop. fasciiventris. Mas. *Viridis, antennis pedibusque flavis, abdomine cupreo flavo fasciato, alis hyalinis.*

Mesopolobus fasciiventris. *Westwood, Lond. and Edinb. Phil. Mag. Third Series. Vol. II. No. XII. p. 443.*

Lætè viridis, nitens: oculi ocellique rufo-fusci: trophi lætè flavi: mandibulæ apice rufæ: antennæ lætè flavæ, corporis dimidii longitudine: metathorax subtilissimè squameus: abdomen cupreum, ante medium latè flavo fasciatum, apice viride: sexualia fusca: pedes lætè flavi, graciles; coxæ virides; mesotibiarum lobi apice nigri et pilis nigris vestiti; tarsi apice pallidè fusci: alæ hyalinæ, subangustæ, inter nervos cubitalem et radialem fuscae; squamulæ flavæ; nervus humeralis flavus, pilis nonnullis nigris vestitus, ubi costam attingit obscurè fuscus; ulnaris pallidè fulvus; radialis obscurior; cubitalis obscurè fuscus; stigma concolor, parvum; metalarum nervi pallidè flavi, ubi costam attingunt fulvi. (Corp. long. $\frac{2}{3}$ — $1\frac{1}{4}$ lin.; alar. $\frac{3}{4}$ — $1\frac{1}{2}$ lin.)

Var. β . — Caput, thorax et coxæ æneo-viridia: abdomen basi cupreo-æneum.

Var. γ .—Var. β . similis: antennæ articulis 1^o. apice et 2^o. supra pallidè fulvis: alæ inter nervos cubitalem et radialem subhyalinæ; nervi pallidiores.

Var. δ .—Metalarum nervi ubi costam attingunt fusci.

Var. ϵ .—Abdomen basi æneo-viride.

Var. ζ .—Thorax anticè et caput cyaneo-viridia: abdomen basi æneo-viride.

Var. η .—Nervus cubitalis et stigma pallidè fusca.

Var. θ .—Nervi pallidè fulvi; nervus humeralis ubi costam attingit fuscus.

May and June; on grass beneath trees; near London. June; New Forest, Hampshire. September; Isle of Wight.

GENUS XII.—EUTELUS,^c Walker.

Mas et Fem. — Corpus multiforme: caput mediocre: antennæ clavatæ; articulus 1^{us}, *mas* subfusiformis, *fem.* sublinearis gracilior; 3^{us}, et 4^{us}. minimi; 6^{us}. 5^o. longior; sequentes ad 10^{um}. gradatim breviores et latiores; clava articulo 10^o. latior et plus duplò longior: mandibulæ 4-dentatæ, subquadratæ, vix arcuatæ, intus emarginatæ; una dente externo mediocri acuminato, 2^o. obtusiore minore, 3^o. et 4^o. minutis, hoc latiore obtusiore; altera dentibus brevioribus, 3^o. et 4^o. minimis vix discretis aut conspicuis: maxillæ elongatæ, subarcuatæ, basi latæ; intus lacinia quæque in lobum producta; palpi 4-articulati, graciles, filiformes, longitudine mediocri; articuli 1^{us}., 2^{us}., et 3^{us}. mediocres subæquales; 4^{us}. subfusiformis, 2ⁱ. et 3ⁱ. longitudine: labium elongato-ovatum, posticè conicum; ligula parva, anticè quasi fissa; palpi 3-articulati, breves, crassi; articulus 2^{us}. minimus: prothorax et metathorax brevia: mesothoracis scutum et scutellum maxima; parapsidum suturæ vix conspicuæ; paraptera et epimera benè determinata: *fem.* abdomen acuminatum; segmentum 1^{um}. magnum; sequentia breviora, subæqualia: oviductus plerumque occultus: pedes simplices; mesofemora sæpè apices versus spina armata: alæ mediocres; nervus humeralis ulnari multò longior, ramulum rejiciens nullum; cubitalis radiali brevior; stigma ramulum brevissimum emittens.

Sp. 1. Eut. dilectus. Mas. *Viridis, antennis pedibusque flavis, illarum articulo 8^o. clavaque fuscis, abdomine cupreo flavo fasciato, alis hyalinis.*

Lætè viridis, latus: caput thorace paullò latius: oculi ocellique fusciorufi: antennæ lætè flavæ, corporis dimidii longitudine; articulus 1^{us}. validus; 8^{us}. pallidè fuscus; clava fusca, apice pallidior: thorax elongato-ovatus: abdomen cupreum, ovatum, thoracis longitudine, ante medium flavo latè fasciatum, basi apiceque viride; segmenta basi æneo-viridia: sexualia fusca: pedes lætè flavi; coxæ virides; tarsi apice fusci: alæ hyalinæ; squamulæ et nervi flava, hi pilis nigris vestiti; pro- et metalarum nervi humerales ubi costam attingunt pallidè fusci; stigma concolor, parvum. (Corp. long. $\frac{2}{3}$ —1 $\frac{1}{4}$ lin.; alar. 1—2 lin.)

Var. β.—Antennæ articulo 2^o. basi fusco: alæ subflavescentes.

^c εὐ benè, τέλος finis.

Var. γ.—*Var. β.* similis: alæ hyalinæ; stigma flavum.

Var. ζ.—Abdominis segmenta basi cuprea: stigma flavum.

Var. ε.—Metathorax basi æneus.

Var. ζ.—Caput et thorax æneo-viridia: abdomen purpureo-cupreum: stigma flavum.

June to October; on grass beneath trees; near London.
June; Windsor. September; Linton, North Devonshire.
New Lanark, Scotland.

Sp. 2. Eut. immaculatus. Mas. *Viridis, antennis pedibusque flavis, illarum articulo 8°. clavaque fuscis, abdomine cupreo, alis hyalinis.*

Lætè viridis, crassus, *E. dilecti* statura: caput thorace paullò latius: oculi ocellique rufo-fusci: antennæ lætè flavæ, corporis dimidii longitudine; articulus 1^{us}. validus; 8^{us}. pallidè fuscus; clava fusca, apice pallidior: abdomen cupreum, immaculatum, thorace paullò brevius et angustius, basi apiceque cupro-æneum: sexualia fusca: pedes læte flavi; coxæ virides; tarsi apice pallidè fusci; protibiæ apice et protarsi fulvo-flava: alæ hyalinæ; squamulæ flavæ; nervi pallidè fulvi; stigma minutum. (Corp. long. 1 lin.; alar. 1½ lin.)

Var. β.—Metathorax æneo-viridis.

August; on grass beneath trees; near London.

Sp. 3. Eut. signatus. Mas. *Viridis, E. dilecto angustior, antennis pedibusque flavis, illarum articulo 8°. clavaque fuscis, abdomine cupreo flavo fasciato, alis hyalinis.*

Viridis, *E. dilecto* minor angustior et multò obscurior: caput thorace latius: oculi ocellique rufo-fusci: antennæ pallidè flavæ, corporis dimidii longitudine; articuli 2^{us}. supra, 7^{us}. apice et 8^{us}. fusci; clava nigro-fusca, apice basique flava: abdomen cupreum, thorace paullò brevius, flavo antè medium latè fasciatum: sexualia fusca: pedes pallidè flavi; coxæ virides; tarsi apice pallidè fusci: alæ hyalinæ; squamulæ flavæ; nervi pallidè fulvi; stigma parvum. (Corp. long. ½ lin.; alar. ⅔ lin.)

September; Ambleside, Westmoreland.

Sp. 4. Eut. pygmæus. Mas. *Viridis*, E. dilecto *angustior*, *antennis fulvis*, *articulo 2º. clavaque fuscis*, *abdominis fascia pedibusque flavis*, *alis hyalinis*.

Viridis, E. dilecto *angustior* et minor: caput thoracis latitudine: antennæ fulvæ, corporis dimidio paullò longiores; articulus 1^{us}. lætè flavus; 2^{us}. fuscus, apice flavescens; clava fusca; oculi ocellique rufo-fusci: abdomen thoracis longitudine, ante medium flavo fasciatum: pedes lætè flavi; coxæ virides; tarsi apice pallidè fusci; alæ hyalinæ; squamulæ et nervi pallidè flava; stigma minutum. (Corp. long. $\frac{1}{2}$ lin.; alar. $\frac{1}{2}$ lin.)

August; on grass beneath trees; near London.

Sp. 5. Eut. diffinis. Mas. *Viridis*, *antennis fulvis apice fuscis*, *abdomine fulvo fasciato*, *pedibus flavis*, *alis hyalinis*, *metallicis fusco maculatis*.

Lætè viridis, E. dilecto paullò *angustior*: caput thorace vix latius: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidii longitudine; articulus 1^{us}. flavus; 2^{us}. basi, 3ⁱ. et sequentium ad 8^{um}. suturæ et clava fusca, hæc apice pallidior: abdomen æneo-viride, thorace paullò brevius, basi apiceque viride; segmentum 2^{um}. apice fulvum: pedes lætè flavi; coxæ virides; mesotibiæ intus et tarsi apice fusca: alæ hyalinæ; squamulæ et nervi flava; stigma minutum: metalæ nisi ad basim subfusca; maculæ in cujusque disco fusca irregulares medio connectæ duæ. (Corp. long. $\frac{1}{3}$ — $\frac{3}{4}$ lin.; $\frac{1}{2}$ —1 lin.)

Var. β.—Caput et thorax æneo-viridia.

Var. γ.—Mesotibiæ intus ad apices obscurè fusca, ante apices flavæ.

Var. δ.—Proalæ sub nervum ulnarem fulvescentes.

August to October; on grass in fields; near London. September; Isle of Wight; Lyme Regis, Dorsetshire; Sidmouth and Plymouth, Devonshire. New Lanark, Scotland.

Sp. 6. Eut. jucundus. Mas. *Viridis*, *antennis pedibusque flavis*, *abdomine cupreo flavo fasciato*, *alis hyalinis*.

Lætè viridis, angustus: caput thorace vix latius: oculi ocellique rufo-fusci: antennæ lætè flavæ, corporis dimidio paullò breviores: caput posticè thoracisque latera et apex æneo-viridi variegata: abdomen cupreum, thorace paullò brevius, ante medium latè

flavo-fasciatum, apice viride: pedes lætè flavi; coxæ æneo-virides; tarsi apice pallidè fuscis: alæ hyalinæ; squamulæ pallidè flavæ; nervi pallidè fulvi; stigma minutum. (Corp. long. $\frac{3}{4}$ — $1\frac{1}{4}$ lin.; alar. $1\frac{1}{4}$ — $1\frac{3}{4}$ lin.)

Var. β .—Caput et thorax omnino viridia.

Var. γ .—Abdomen basi æneo-viride.

May and June; on grass beneath trees; near London.

Sp. 7. Eut. placidus. Mas. *Viridis*, E. diffinis *statura*, *antennis flavis fusco maculatis*, *pedibus flavis*, *alis hyalinis*.

Lætè viridis: caput thorace vix latius: oculi ocellique rufo-fusci: antennæ fuscæ, corporis dimidio paullò longiores; articuli 1^{us}., 3^{us}., 4^{us}., 5^{us}., et 8^{us}. flavi; 9^{us}. et 10^{us}. pallidè fuscis: abdomen thorace paullò longius; discus cupreo-viridis: sexualia fusca: pedes lætè flavi; coxæ virides; tarsi apice pallidè fuscis; pro-tarsi fulvi: alæ hyalinæ; squamulæ et nervi pallidè flava; stigma minutum. (Corp. long. $\frac{3}{4}$ lin.; alar. 1 lin.)

Var. β .—Antennæ articulo 8^o. supra pallidè fusco.

Var. γ .—Mesothoracis paraptera et epimera æneo-viridia: antennæ articulo 8^o. pallidè fusco: abdominis discus obscurè cupreus.

Var. δ .—Antennæ articulis 6^o. et 7^o. pallidè fuscis; 8^o., 9^o. et 10^o. fulvis: thoracis latera abdominisque margo æneo-viridia.

August; on lime-trees; near London.

Sp. 8. Eut. ocellus. Mas. *Viridi-æneus*, *antennis nigris*, *abdominis fascia flava*, *pedibus fulvis*, *pro-alis quasi ocelligeris*.

Viridi-æneus, obscurus, latus: caput thorace paullò latius: oculi ocellique rufo-fusci: trophi fuscis: antennæ nigrae, corporis dimidii longitudine, apice nigro-fuscæ; articulus 1^{us}. pallidè flavus; 2^{us}., 3^{us}. et 4^{us}. pallidè fuscis: abdomen cupreum, thoracis longitudine, ante medium flavo-fasciatum, apice viridescens: pedes fulvi, validi; coxæ cyaneo-virides; genua, tibiæ basi, meso- et metatarsi flava, hi apice pallidè fuscis: alæ subfulvescentes, angustæ, breves, infectæ?; proalæ fusco apice marginatæ et substigmatè maculatæ; squamulæ et nervi pallidè fusca, nervus ulnaris obscurior; stigma obscurè fuscum, mediocre. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ lin.)

New Lanark, Scotland.

Sp. 9. Eut. eximius. Fem. *Æneus aut viridis, antennis pedibusque fulvis, alis hyalinis plus minusve flavescens*.

Lætè æneus, latus: caput thoracis latitudine, posticè viride: oculi ocellique rufo-fusci: antennæ fulvæ, subtus pallidiores, corporis dimidio vix breviores; articulus 1^{us}. pallidè fulvus; sequentes basi fusci: thorax ovatus; segmentorum margines virides: abdomen cupreo-æneum, thorace paullo brevius, subtus non angulatum; discus obscurè cupreus: pedes fulvi; coxæ viridi-æneæ; genua, tibiæ apice tarsique flava; hi apice fusci; protibiæ et protarsi fulvo-flava: alæ hyalinæ, sub costam flavescens; squamulæ et nervi flava; stigma minutum. (Corp. long. 1—1½ lin.; alar. 1½—2½ lin.)

Var. β.—Æneo-viridis: abdomen basi viride; segmenta 1^o. ad 4^{um}. purpureo-cuprea.

Var. γ.—Lætè viridis: abdomen æneum, basi lætè viride, medio cupreum: coxæ virides; profemora et protibiæ flava: alæ vix flavescens.

September and October; on oak-trees; near London. New Lanark, Scotland.

Sp. 10. Eut. platycerus. Fem. *Æneus, antennis pedibusque fuscis, tarsis pallidè flavis, alis hyalinis plus minusve flavescens*.

Æneus, latus, parùm nitens: caput æneo-viride, thoracis latitudine: oculi ocellique rufo-fusci: antennæ fuscæ, validæ, corporis dimidii longitudine, subtus pallidiores; articulus 1^{us}. omninò 2^{us}.-que subtus fulvi: abdomen obscurè cupreum, thoracis longitudine, basi lætè æneo-viride, subtus non angulatum; segmenta basi viridia: pedes pallidè fusci; coxæ æneo-virides; trochanteres, femora apice, tibiæ apice et basi tarsique pallidè flava; hi apice fusci; protibiæ et protarsi fulva: alæ hyalinæ, subflavescens; squamulæ fulvæ; nervi flavi; stigma fulvum, parvum. (Corp. long. 1—1½ lin.; alar. 1½—1¾ lin.)

Var. β.—Caput viride: thorax viridi-æneus.

Var. γ.—Caput viridi-æneum: thorax cupreo-æneus; segmentorum margines virides.

Var. δ.—Caput viride: thorax cupreus: abdominis segmenta basi ænea.

Var. ε.—Thorax viridi-æneus, cupreo variegatus.

Var. ζ.—Thorax æneo-cupreus; segmentorum margines virides: abdominis segmenta basi viridi-ænea.

Var. η.—Caput viride: thorax viridi-æneus; mesothoracis scutellum cupreo-æneum.

Var. θ.—Caput cyaneo-viride: thorax æneo-cupreus: meso- et metapedum femora et tibiæ fusca: alarum nervi fulvi; stigma fuscum.

Var. ι.—Metathorax æneo-viridis.

Var. κ.—Abdominis segmenta basi ænea.

Var. λ.—Antennæ articulo 1^o. pallidè fusco: alarum nervi fulvi; stigma fuscum.

Var. μ.—Tibiæ omnes fulvæ.

Var. ν.—Protibiæ et protarsi flava.

June to October; on grass beneath trees; near London. June and September; Isle of Wight. June; New Forest, Hampshire. September; Sidmouth, Devonshire.

Sp. 11. Eut. bicolor. Fem. *Præcedentis ferè statura, plerumque major, colore lætiore, pedibus pallidioribus.*

Æneus: caput viride, thorace sublatius: oculi ocellique rufo-fusci: antennæ pallidè fuscae, corporis dimidii vix longitudine; articulus 1^{us}. omninò 2^{us}.—que subtus fulvi: mesothoracis scutellum cupreo-æneum: abdomen æneum, thorace paulò longius; segmentum 1^{um}. basi æneo-viride cupreo maculatum; sequentia apice obscurè cuprea: pedes fulvi; coxæ viridi-æneæ; genua, tibiæ apice et tarsi flava; hi apice obscurè fusci; protibiæ et protarsi pallidè fulva; alæ hyalinæ, minimè flavescentes; squamulae et nervi fulva; stigma paulò obscurius, parvum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar, $1\frac{3}{4}$ —2 lin.)

Var. β.—Abdominis segmenta basi cupreo-ænea.

Var. γ.—Femora, meso- et metatibiæ pallidè fusca.

September; on grass in fields; near London. Isle of Wight.

Sp. 12. Eut. platynotus. Fem. *Viridis, E. platyceri statura.*

Viridis: caput cyaneo-viride, thorace vix latius: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidii longitudine, supra pallidè fuscae, apice obscuriores; articulus 1^{us}. fulvus: abdomen thoracis longitudine; segmenta apice cupreo-ænea: pedes fusci; coxæ virides; tibiæ apice tarsisque straminea, hi apice fusci;

trochanteres, genua, protibiæ et protarsi fulva: alæ hyalinæ; squamulæ et nervi fulva; stigma parvum. (Corp. long. $\frac{3}{4}$ —1 lin.; alar. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.)

Var. β.—Thorax posticè æneo-viridis: protibiæ et protarsi flava.

July; on grass beneath trees; near London.

Sp. 13. Eut. sobrinus. Fem. *Præcedentibus 3 paullo longior.*

Æneus: caput viride, thorace sublatius: oculi ocellique rufo-fusci: antennæ obscurè fulvæ, corporis dimidii longitudine, supra fuscæ; clava obscurior; articulus 1^{us}. fulvus, apice fuscus: thoracis latera viridi-ænea: abdomen obscurè cupreum, thorace paullo longius; segmenta basi lætè æneo-viridia: pedes fusci; coxæ æneæ; femora viridi-fusca; meso-femora apices versus spina fusca subtus armata; trochanteres et protarsi fulva; genua, tibiæ apicè tarsique flava, hi apice fusci; protibiæ flavæ, extus fuscæ: alæ hyalinæ, minimè fulvescentes; squamulæ et nervi fulva; stigma obscurius, parvum. (Corp. long. 1— $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ — $1\frac{3}{4}$ lin.)

Var. β.—Caput inter oculos æneo-viride: antennæ articulis 1^o, 3^o. 4^o.-que omninò fulvis: thorax viridi-æneus: protibiæ extus fulvæ.

Var. γ.—Caput inter oculos æneo-viride: antennæ fuscæ; articulus 1^{us}. fulvus: thoracis dorsum cupreo-æneum: abdominis segmenta 2^{um}. et sequentia basi ænea.

Var. δ.—Antennæ articulo 1^o omninò fulvo; thorax supra cupreo-æneus; segmentorum margines virides: abdominis segmentum 1^{um}. basi cupreo variegatum.

Var. ε.—Thorax supra abdominisque segmenta 2^{um}. et sequentia basi cupreo-ænea; protibiæ utrinque fuscæ; pro-alæ fulvescentes.

Var. ζ.—Mesothoracis scutellum cupreo-æneum: abdominis segmenta basi viridi-ænea.

May and June; on grass in fields; near London. June; Windsor.

Sp. 14. Eut. catenatus. Fem. *Viridis, 4-præcedentibus angustior.*

Viridis: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fusco-fulvæ, corporis dimidii longitudine; articulus 1^{us}. fulvus: mesothoracis scutum æneo-viride: abdomen cupreum, thorace paullo longius; segmenta basi æneo-viridia: pedes fulvi; coxæ virides; femora, meso- et metatibiæ fusca, apice flava;

meso- et metatarsi flavi, apice fusci: alæ hyalinæ, nonnunquam minimè flavescentes; squamulæ et nervi fulva; stigma parvum. (Corp. long. $\frac{5}{4}$ —1 lin.; alar. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.)

Var. β.—Caput inter oculos thoracisque dorsum æneo-viridia.

June; on grass beneath trees; near London; New Forest, Hampshire.

Sp. 15. Eut. inornatus. Fem. *Æneus, antennis nigris, pedibus fuscis, alis subfuscis.*

Obscurè æneus, brevis: caput nigrum, thorace vix latius: oculi ocellique rufo-fusci: antennæ nigræ, corporis dimidio breviores; articulus 1^{us}. basi fuscus: abdomen cupreo-æneum, thorace latius sed non longius, subtus non angulatum; segmentum 1^{um}. basi et sequentia apice viridi-ænea: pedes fusci; coxæ æneæ; femora apice, tibiæ basi, trochanteres et tarsi fulva, hi apice fusci: alæ subfuscae; squamulæ et nervi fusca; stigma minutum. (Corp. long. $\frac{5}{4}$ lin.; alar. $1\frac{3}{4}$ lin.)

Var. β.—Caput, thorax utrinque et posticè, coxæ et femora obscurè viridia.

Var. γ.—Abdomen basi cupreo-viride.

September; Westmoreland and Cumberland.

Sp. 16. Eut. fulvicornis. Fem. *Æneo-viridis, E. dilecto angustior, antennis fulvis, pedibus flavis, alis hyalinis.*

Lætè æneo-viridis: caput thoracis latitudine: oculi ocellique rufo-fusci: antennæ fulvæ, corporis dimidio breviores; clava pallidior; articulus 1^{us}. flavus: abdomen thorace longius, subtus paullò angulatum, apice acuminatum vix attenuatum; discus et apex obscurè cuprei: oviductus fulvus: pedes lætè flavi; coxæ virides; tarsi apice fusci; protarsi fulvo-fusci: alæ hyalinæ, sub costam minimè flavescents; squamulæ et nervi flava; horum humeralis ubi costam attingit et cubitalis fulvi; stigma minutum. (Corp. long. 1— $1\frac{1}{2}$ lin.; alar. $1\frac{1}{2}$ — $2\frac{1}{2}$ lin.)

Var. β.—Caput et thorax viridia, hujus segmentorum margines æneo-virides.

Var. γ.—Caput et thorax omninò viridia.

Var. δ.—Cyaneo-viridis: abdomen viride; discus cupreus.

Var. ε.—Antennæ articulo 1^o. apice supra pallidè fulvo.

Var. ζ.—Abdomen cupreo-æneum; discus obscurè purpureo-cupreus.

Var. η.—Abdomen basi cupreo-viride.

Var. θ.—Abdomen supra obscurè cupreum, basi cupreo-viride, subtus et utrinque æneum segmentis basi cupreis.

Var. ι.—Nervi omnino flavi.

Var. κ.—*Var. ι* similis : metafemora fulva.

Var. λ.—*Var. κ* similis : abdomen cupreum, basi lætè viride ; segmenta utrinque et subtus basi viridia.

Var. μ.—*Var. κ* similis : antennæ fusco-fulvæ.

Var. ν.—Nervi radialis et ulnaris fulvi.

July to October ; on grass in fields ; near London. September ; Isle of Wight ; Linton, Devonshire ; New Lanark, Scotland.

Sp. 17. Eut. flavipes. Fem. *Viridis, antennis fuscis, pedibus flavis, alis hyalinis.*

Lætè viridis : caput thorace paullò latius : oculi ocellique rufo-fusci : antennæ fuscae, corporis dimidii longitudine ; articulus 1^{us}. basi fulvus ; 2^{us}. supra obscure fuscus : thorax brevis : abdomen longius et gracilius, basi angustum, medio supra obscure cupreum, subtus æneum non angulatum : pedes flavi ; coxæ virides ; tarsi apice fusci ; protarsi fulvi : alæ hyalinæ ; squamulæ et nervi flava ; stigma fulvum, minutum. (Corp. long. $\frac{3}{4}$ lin. ; alar. $1\frac{1}{4}$ lin.)

July ; on grass in fields ; near London.

Sp. 18. Eut. æquus. Fem. *Æneo-viridis, antennis fusco-fulvis, pedibus flavis, alis hyalinis.*

Æneo-viridis, angustus, sublinearis : caput thorace latius : oculi ocellique rufo-fusci : antennæ fusco-fulvæ, corporis dimidio breviores ; articulus 1^{us}. pallidè fulvus : abdomen æneum, thorace paullò brevius et latius, basi cupreo-viride, subtus non angulatum, apice vix acuminatum : pedes lætè flavi ; coxæ æneo-virides ; trochanteres pallidè fulvi ; meso- et metatarsi straminei, apice fusci : alæ hyalinæ, minimè flavescentes ; squamulæ et nervi flava ; stigma minutum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin. ; alar. $1\frac{1}{2}$ —2 lin.)

Var. β.—Viridis : antennæ articulo 1^o. supra apice fusco-fulvo : abdominis discus cupreus.

Var. γ.—Antennæ fuscae, apice fusco-fulvæ : abdomen æneo-viride.

Var. δ.—Antennæ fuscae ; articulus 1^{us}. fulvus, basi flavus : abdomen viride, basi nitentius ; discus cupreus : metathorax lætè viridis.

Var. ε.—Abdomen cupreo-æneum ; discus obscure cupreus.

Var. ζ.—Thoracis dorsum cupreo et purpureo maculatum.

Var. η.—Femora omnia et mesofemora præcipuè basi fulva.

August to October; on grass in fields; near London. September; Isle of Wight. New Lanark, Scotland.

Sp. 19. Eut. planus. Fem. *Cyaneo-viridis, antennis nigris, pedibus flavis, alis hyalinis.*

Lætè cyaneo-viridis, angustus, elongatus: caput viride, thorace vix latius: oculi ocellique rufo-fusci: antennæ nigræ, corporis dimidio breviores, apice fuscae; articulus 1^{us}. flavus, apice nigro-fuscus: abdomen æneum, thorace paullo brevius, subtus non angulatum; discus cupreo-æneus: pedes lætè flavi; coxæ virides; meso- et metapedum tibiæ tarsique straminea, hi apice pallidè fusci: alæ hyalinæ, apice subgriseæ; squamulæ et nervi flava; stigma minutum. (Corp. lon. 1½ lin.; alar. 2½ lin.)

May; on grass beneath trees; near London.

Sp. 20. Eut. gracilis. Fem. *Viridis, antennis nigris, pedibus flavis, alis hyalinis.*

Lætè viridis, angustus, elongatus: caput thorace vix latius; oculi ocellique rufo-fusci: antennæ nigræ, corporis dimidio breviores, apice nigro-fuscae; articulus 1^{us}. fulvus, apice nigro-fuscus: mesothoracis scutellum æneo-viride: abdomen thorace paullo longius, subtus non angulatum; discus cupreus; segmenta basi subtus et utrinque ænea: pedes lætè flavi; coxæ virides; tarsi apice fusci: alæ hyalinæ; squamulæ flavæ; nervi pallidè fulvi; stigma minutum. (Corp. long. 1½ lin.; alar. 2 lin.)

New Lanark, Scotland.

Sp. 21. Eut. helvipes. Fem. *Viridis, pedibus flavis, antennis femoribusque fulvis, alis hyalinis.*

Lætè viridis, longus, angustus: caput thoracis latitudine: oculi ocellique fusco-rufi: trophi flavi: antennæ fulvæ, corporis dimidio breviores, supra fuscae; articulus 1^{us}. omnino fulvus: abdomen cupreum, angustum, thorace longius, subtus non angulatum; segmentum 1^{um}. basi lætè viride; sequentia basi æneo-viridia: pedes lætè flavi; coxæ virides; trochanteres pallidè fulvi; femora fulva; metafemora fusca; tarsi apice fusci: alæ hyalinæ; squamulæ et nervi pallidè flava; stigma minimum. (Corp. long. 1½ lin.; alar. 1½ lin.)

New Lanark, Scotland.

Sp. 22. Eut. posticus. Fem. *Æneo-cupreus, antennis nigris, pedibus fulvo-flavis, alis hyalinis.*

Æneo-cupreus, obscurus: caput viridi-æneum, thoracis latitudine: oculi ocellique rufo-fusci: antennæ nigræ, corporis dimidio paullo breviores, apice nigro-fuscæ; articulus 1^{us}. basi fulvus: thorax angustus; metathorax lætè viridis: abdomen purpureo-cupreum, thorace latius sed non longius, apice et subtus viridi-æneum; segmentum 1^{um}. cupreo-viride; reliqua basi viridia: pedes flavi; coxæ virides; femora basi fusca; profemora basi fulva; meso- et metatibiæ et protarsi fulva, illæ basi apiceque flavæ; tarsi apice fusci: alæ minimè fuscæ, parvæ; squamulæ et nervi fulva; stigma fuscum, parvum. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{2}{3}$ lin.)

New Lanark, Scotland.

Sp. 23. Eut. elevatus. Fem. *Æneo-viridis, antennis nigris, pedibus fulvis, femoribus viridibus, alis subhyalinis.*

Æneo-viridis, obscurus: caput thoracis vix latitudine: oculi ocellique rufo-fusci: antennæ nigræ, corporis dimidio paullo breviores, apice nigro-fuscæ; articulus 1^{us}. viridis, basi fulvus; 2^{us}. æneo-viridis: abdomen thorace longius, subtus angulatum, apice elevatum acuminatum attenuatum; segmenta apice viridia: pedes fulvi; coxæ æneo-virides; femora viridia, apice fulva; trochanteres et protarsi fusci; meso- et metapedum tibiæ apice tarsique basi flava: alæ subhyalinæ; squamulæ et nervi fulva; stigma obscurius, parvum. (Corp. long. $1\frac{1}{4}$ —2 lin.; alar. $1\frac{2}{3}$ — $2\frac{2}{3}$ lin.)

Var. β.—Meso- et metafemora fusco cingulata.

Var. γ.—Viridi-æneus: abdomen basi æneum.

Var. δ.—Antennæ nigro-fuscæ: abdomen æneo-viride; segmenta basi cuprea.

September; Isle of Wight.

Sp. 24. Eut. intermedius Fem. *Præcedenti similis; abdomen paullo brevius et latius.*

Viridi-æneus, obscurus: caput æneo-viride, thoracis latitudine: oculi ocellique rufo-fusci: antennæ fuscae, corporis dimidii longitudine; articulus 1^{us}. basi fulvus: abdomen lætè viride, thorace vix longius, apice basique cupreo variegatum, medio cupreum: pedes flavi; coxæ et femora æneo-viridia; tibiæ fusco fasciatæ; tarsi apice fusci; trochanteres, protibiæ et protarsi fulva: alæ subhy-

alinæ; squamulæ et nervi fulva, horum humeralis flavus; stigma parvum, obscurius. (Corp. long. $1\frac{1}{2}$ lin.; alar. 2 lin.)

Var. β.—Meso- et metatibiæ fulvo fasciatæ: alarum squamulæ fulvæ; nervi flavi; stigma fuscum.

September; Isle of Wight.

Sp. 25. Eut. semotus. Fem. *Viridi-æneus, antennis fuscis, pedibus flavis fusco cingulatis, alis hyalinis.*

Viridi-æneus, obscurus, *E. clavato* et *intermedio* abdomine minus attenuato hoc quoque antennis gracilioribus discretus: caput æneo-viride, thoracis latitudine: oculi ocellique rufo-fusci: antennæ obscurè fuscæ, corporis dimidii longitudine; articulus 1^{us}. fusco-viridis, basi fulvus: abdomen purpureo-cupreum, apice elevatum cupreo-viride, subtus angulatum cupreum; segmentum 1^{um}. cupreum, basi viride; 2^{um}. et sequentia ad 5^{um}. apice ænea: pedes flavi; coxæ virides; trochanteres fusci; femora fusco-viridia; tibiæ fusco cingulatæ; tarsi apice fusci; protibiæ et protarsi fulva: alæ hyalinæ; squamulæ fulvæ; nervi flavi; stigma fuscum, parvum. (Corp. long.; $1\frac{1}{2}$ — $1\frac{3}{4}$ lin.; alar. 2— $2\frac{1}{2}$ lin.)

Var. β.—Antennæ articulo 1^o. fusco basi fulvo: abdominis segmentum 1^{um}. basi cupreo maculatum, 5^{um}. basi æneo-viride: meso- et metatibiæ fulvo cingulatæ.

September; Isle of Wight.

Sp. 26. Eut. altus. Mas et Fem. *Viridis, antennis fuscis, pedibus fulvo flavis, femoribus viridibus, alis subhyalinis.*

Mas.—Cyaneo-viridis, crassus: caput thorace latius: oculi ocellique rufo-fusci: antennæ fuscæ, corporis dimidii longitudine; articulus 1^{us}. fulvus, apice fuscus: abdomen thoracis longitudine; discus cupreus: sexualia fusca: pedes lætè flavi; coxæ virides; femora viridi-fusca, apice basique flava; tarsi apice fusci; protarsi fulvi: alæ subhyalinæ; squamulæ et nervi pallidè fusca; stigma parvum.

Fem.—Lætè viridis: antennæ corporis dimidio breviores: abdomen cyaneo-viride; segmenta basi cuprea: trochanteres fusci; femora viridia, apice basique fusca; tibiæ fulvæ, apice flavæ; metatibiæ fusco cingulatæ; protarsi fusci. (Corp. long. 1— $1\frac{1}{2}$ lin.; alar. $1\frac{1}{2}$ — $1\frac{3}{4}$ lin.)

Var. β.—*Fem.* antennæ obscurè fuscæ; articulus 1^{us}. basi fulvus: abdominis discus cupreus: tibiæ fuscæ, apice basique fulvæ; squamulæ et nervi obscurè fusca.

June; Windsor Forest.

Sp. 27. Eut. chlorospilus. Mas et Fem. *Viridis aut æneus, antennis nigris aut fuscis, maris abdomine flavo maculato, pedibus fuscis, femoribus nonnunquam viridibus, tarsis flavis, alis subhyalinis.*

Mas.—Æneus, obscurus: caput æneo-viride, thorace latius: oculi ocellique fuscis: antennæ fuscæ, corporis dimidii longitudine; articulus 1^{us}. fulvus, apice fuscus: abdomen obscurè æneo-viride, thoracis longitudine, basi viride nitentius, ante medium flavo maculatum: sexualia pallida: pedes fuscis; coxæ æneo-virides; femora viridi-fusca; tibiæ apice basique flavæ; tarsi flavi, apice fuscis: alæ subhyalinæ; squamulæ et nervi pallidè fusca; stigma mediocre.

Fem.—Viridi-æneus: antennæ nigro-fuscæ, corporis dimidio breviores; articulus 1^{us}. niger, basi fuscus: abdomen thorace paullo longius, subtus angulatum, basi lætè viride: oviductus fulvus: pedes flavi; coxæ viridi-æneæ; femora fusca; tibiæ fusco cingulatæ; tarsi apice fuscis: protibiæ et protarsi fulvo-flava. (Corp. long. $\frac{3}{4}$ —1 lin.; alar. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.)

Var. β.—*Fem.* Viridis: antennæ nigræ; articulus 1^{us}. nigro-viridis, basi fuscus: abdomen cupreum, basi, apice et subtus viride: coxæ et femora viridia; trochanteres et tibiæ fusca.

September; Isle of Wight. Exeter, Devonshire.

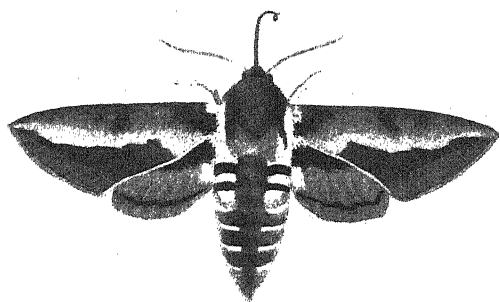
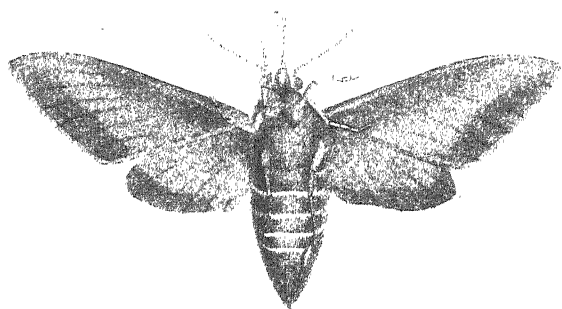
Sp. 28. Eut. fuscipennis. Fem. *Æneo-viridis, antennis nigro-fuscis, pedibus fuscis, femoribus viridibus, alis fuscis.*

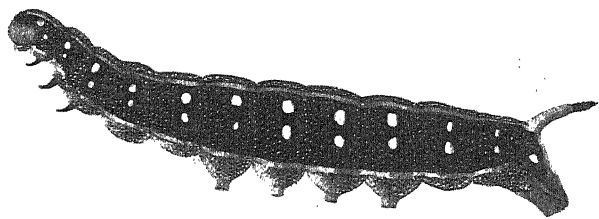
Obscurè æneo-viridis: caput obscurè viride, thorace latius: oculi ocellique rufo-fuscis: antennæ nigro-fuscæ, corporis dimidio breviores, apice subtus pallidiores; articulus 1^{us}. fulvus: mesothorax posticè et metathorax virides: abdomen obscurè cupreum, thorace paullo longius, subtus angulatum, basi lætè viride, apice æneo-viride; segmenta utrinque basi viridia: pedes fuscis; coxæ et femora viridia, hæ apice basique fusca; tibiæ viridi-fuscæ, apice flavæ; tarsi flavi, apice fuscis; protibiæ et protarsi fulva, hi apice fuscis, illæ apice flavæ: alæ fuscæ, basi pallidiores; squamulæ et nervi obscurè fusca; stigma mediocre. (Corp. long. $1\frac{1}{2}$ — $1\frac{2}{3}$ lin.; alar. 2 — $2\frac{1}{4}$ lin.)

Var. β.—Antennæ articulo 1^o. apice fusco: thorax viridis: abdominis segmenta supra basi cyaneo-viridia.

Var. γ.—Metathorax cupreo-viridis.

June; Windsor Forest.





Sp. 29. Eut. politus. Fem. *Viridis, antennis fuscis basi viridibus, pedibus flavo-fulvis, femoribus viridibus, alis hyalinis.*

Lætè viridis, ferè glaber: caput thorace vix latius: oculi ocellique rufo-fusci: antennæ fuscae, corporis dimidio breviores; articuli 1^{us}. et 2^{us}. virides: thorax crassus, hujus familiæ plerisque lævior, anticè utrinque æneo-viridis: abdomen ferè læve, thorace longius et paullò angustius, subtus non angulatum; discus cupreo-viridis: pedes flavo-fulvi; coxæ et femora viridia, hæ apice flava; tarsi apice fusci; protarsi fulvi: alæ hyalinæ; squamulæ fulvæ, nervi flavi; stigma minimum. (Corp. long. $\frac{5}{8}$ lin.; alar. $1\frac{1}{4}$ lin.)

August; on grass in fields; near London.

Sp. 30. Eut. vagans. Fem. *Æneus, antennis pedibusque fuscis, alis subhyalinis.*

Æneus, ad *Amblymerum* propter articulo 3^o. parvo antennis propinquus: caput posticè viride, thorace paullò latius: oculi ocellique rufo-fusci: antennæ pallidè fuscae, corporis dimidio longiores; clava obscurior; articulus 1^{us}. flavus; 3^{us}. et sequentes ad 6^{um}. fulvi: metathorax viridi-æneus: abdomen thorace paullò longius et latius, subtus viridi-æneum non angulatum: pedes pallidè fusci; coxæ æneæ; tibiæ apice tarsique helva, hi apice pallidè fusci; protibiæ et protarsi fulvæ: alæ subhyalinæ; squamulæ fuscae; nervi pallidè fulvi; stigma obscurius, minutum. (Corp. long. $\frac{1}{2}$ lin.; alar. $\frac{3}{4}$ lin.)

Var. β .—Caput et metathorax omninò viridia: antennæ articulis 3^o. ad 6^{um}. pallidè fuscis.

July; on grass in fields; near London. June; Isle of Wight.

ART. XXXIV. — *Notes on Deilephila Euphorbiæ.* (See Plates VIII. and IX.)

GENTLE READER,—Turn with us to the beautiful plates of *Deilephila Euphorbiæ*, the present of our valued friend, Mr. Raddon. Our friend, we imagine, has no great partiality for the pen; for with so prolific a subject, one which would have elicited from some of our modern entomologists abstruse disquisitions on system, physiology, and metamorphosis, Mr.

Raddon has positively not sent us a single line. We must endeavour to supply the deficiency; we have ourselves watched the progress of a *Sphinx*, from the egg to the imago, and the operations of the whole tribe are nearly similar; we will therefore intertwine our own gleanings with the information Mr. Curtis has given us in his British Entomology, information which that author received from Mr. Raddon.

Gentle Reader,—Let us call thy attention to Curtis's collection of *Sphingites*,—alike, but different. We are turning them over to find out all about *Euphorbiæ*. What exquisite softness, and downyness, and featheryness on that *Death's Head*! and what velvetyness, what rotundity, what life, what reality, in this caterpillar of *Carolina*! surely pencil never told the tale more truly! surely the lovers of beauty never gazed on a more delightful assemblage! Curtis, thou art without compeer!

Gentle Reader,—Pitifully contracted must be the mind that, to preserve consistency, would deviate from the path of rectitude; pitifully shallow must be that reasoning which would lead to perseverance in reproof no longer merited; pitifully weak must be that resolution which shrinks from the *right*, lest others should suppose it *wrong*; but, above all, pitifully painful must be that soul-cramp which attributes all praise after blame to motives of policy or expediency. We have met Mr. Curtis at the social board; we have for years lived on terms of intimacy, we may say of friendship, with him: furthermore, Mr. Curtis was friendly to our undertaking; he was desirous of its success; he exerted himself to assist us: he had an extensive entomological acquaintance, who bowed to his opinion; his good will, his good word, were of great importance to us; yet, even under these circumstances, when he adopted a course which, in our sober, unbiassed judgment, we considered wrong, we did not fail to give the public our opinion openly and boldly,—not in haste; we weighed the consequences well. In our subsequent notices the want of space has compelled us to be brief, very brief; but in pointing out trivial errors, we imagine we have still followed the path of duty; of our praise we have been sparing, perhaps too sparing, but the exceeding beauty of many of the figures from which we have turned without a comment, *must* make its own way, *must* speak its own praise.

Gentle Reader,—We have very unintentionally introduced an episode but little connected with our subject; we crave thy pardon, and proceed. When June, with his bitter blasts and drenching rains, has sodden the immense sand-hills of Braunton Burrows,^a and the few intervals of sunshine have warmed the surface of the reeking sand, the beautiful moths represented in the Plate^b awaken from a winter's slumber, shake off the grave-clothes which had shrouded them, and emerge from the waste of sand like unquiet ghosts deserting their abode in the tombs. On their first appearance the wings are small, clumsy, shapeless appendages, and are more soft and yielding than the lightest silk that undulates with a breath. The newly-born moth, in this state, crawls along the sand till it espies a solitary bent, a stick, a stone, or, better than all, the stem of its favourite plant, *Euphorbia Paralias*; either of these objects it ascends, till it has found firm footing in a vertical position; it then remains stationary, allowing its wings opportunity to expand and strengthen as they droop behind it. In this position it is most beautiful to observe the shivering pulsatory motion by which the blood seems to be forced into its newly-developed channels,—to watch the gradual expansion of the wing, until it has attained its full dimensions,—to mark the satisfied quiet that follows this expansion, while the wings hang side by side, and closely touching behind its back, like those of a butterfly at rest. In half an hour the wings are brought forward, and assume their usual position.

When the sun has been gone for about half an hour below the horizon, the whole tribe of moths begin to quit their diurnal shelter, and venture on the wing. It is then that our beautiful *Deilephila* first essays his newly-acquired powers of flight, and skims rapidly and in circles over the various branches of spurge which are scattered about the surrounding waste; here he finds a virgin-bride, like himself the child of the departed day. Next comes the laying of eggs; these, when first produced, are covered with an adhesive, gummy substance, which enables the female to stick them on the small leaves of the spurge, as represented in Plate IX. In a fortnight these eggs hatch, and produce little black caterpillars, four of which are represented

^a Near Barnstaple, in Devonshire.

^b Plate VIII. The middle figure represents the male, the lower the female, and the upper figure the under side of the insect.

on the same sprig of spurge; the one with red head and tail being a few days older than the others. After this they grow very fast; the middle uncoloured figure represents one at about five weeks old. In nine weeks the caterpillar attains its full size and perfect beauty, as represented in the upper figure; the red line down the back, the red head and tail, and the double row of yellow spots along each side, distinguish it readily from every other described or known caterpillar; when full fed, Mr. Curtis informs us, the caterpillars are so conspicuous that marine birds see them at a distance, and devour great numbers of them.

Two or three days after the caterpillar has attained the size depicted, it ceases to eat, crawls down the stem of the spurge, and roves about on the sand in the most restless manner; after wandering for many hours in this way, it makes a shallow hole in the sand, and, without spinning any web, becomes a chrysalis, as represented by the lowest of the three principal figures; this takes place in September, and in the following June the perfect insect again appears. "Sometimes, however," observes Mr. Curtis, "they remain in the pupa state two seasons, as many of the Lepidoptera do; a wise precaution of nature, to prevent any accident from destroying the whole brood. The sand-hills, where the larvæ are found, being of great extent, must have been collected by the winds and storms to which they are constantly exposed; during the winter the whole soil is frequently removed, so as completely to alter the surface of the country; a great number of the pupæ must consequently be either destroyed, or buried at a considerable depth below the surface, where probably they lie hid until brought to life and light by the influence of the elements."

Mr. Curtis gives a general view of the group called *Crepuscularia*, or *Lovers of twilight*, a name we think rather erroneous. The species are nocturnal or diurnal; but this we apprehend does not make them crepuscular. *Sesia* is a true lover of the sun; its flight is only in his rays; he who has not seen this faëry creature pendulizing over a purple patch of *Ajuga*,—anon descending to sip, without alighting, the sweets of each corolla,—he who has not watched its porrected tube dive into cup after cup, its body the while motionless, its legs shivering, and its wings invisible through excess of motion; he who has not seen it again rise, and again pendulize, and

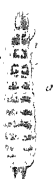


Fig. 2.

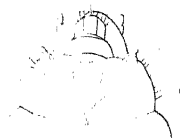
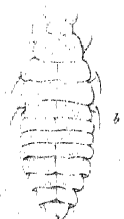


Fig. 3.



then dart off with immeasurable speed; he who has not witnessed these things, has yet a delight to come: let him explore the woods of Kent during the month of May, when the air is calm and sunny, and he will surely be gratified. But what is this at our jasmine, with bird-like head, with brilliant eye, with spread and party-coloured tail, humming loudly, and, though driven off, returning again and again, day after day, from the rising to the setting of the sun? it is *Macroglossa*: from January to December we have some flower welcome to her, and she is welcome, most welcome, to us and ours. *Deilephila*, thy wing is scarcely less alert, and around our honeysuckle we often hear thy happy, thy contented hum, and with our lanthorn light thee to thy feast; but thy wing is not all unwearying, and fain wouldst thou rest awhile on each cup thou drinkest from, and if disturbed flit circling round our head as loth to leave. Next comes the heavy *Sphinx*; his body droops, his tube, longest of all, rifles e'en the *Bignonia's* bloom; his wing is strong, swift and direct his flight, he wastes it not in airy show. O'er widest pastures, o'er the desert plain, o'er ocean's waters, the giant *Acherontia* roams; turning ever and anon his broad side to the blast, he wings his swift course onwards. Lastly, comes thy soft and feeble flight, *Smerinthus*, silent and owl-like as the wafted flake or feather at the midnight hour, when all beside is still.

ART. XXXV. — *Description of some Coleopterous Larvæ.*
By G. R. WATERHOUSE.

Larva of Megatoma serra. Fab. Plate X. Fig. 3.

HEAD corneous: body subcoriaceous, of a dull brown colour, variegated with markings of a deeper hue, and covered with long brown hairs; four of the abdominal segments have a second series of hairs, which are shorter, and very thickly set. The telum is also furnished with a long brush of hairs. (Length, $1\frac{1}{2}$ lin.)

Head subrotundate: antennæ three-jointed; basal joint short and stout; second elongate, narrowed anteriorly and posteriorly; terminal, elongate and slender. The head is furnished with six

stemmata on each side, which are placed behind the base of the antennæ. Maxillary palpi three-jointed, the joints short and compact; labial palpi minute, two-jointed; body twelve-jointed; oblong-ovate, depressed; the segments are of three descriptions. The prothorax, mesothorax, and metathorax are broader (taking the breadth of each segment longitudinally of the insect) than the remaining joints, and without the ridge common to them. The three next joints are very narrow and compact, and have a slightly elevated ridge towards the lower part. Four of the remaining joints are broader than the last mentioned, and have the ridge very much elevated, and forming a base from which the abdominal brush of hairs springs; these hairs, when viewed sideways, present four distinct layers. The telum is very minute, and placed within the apex of the paratelum.

Description of the Figure.

a The larva magnified. *b* The same, with the hairs removed. *cc* Sides of two of the joints at large, showing the part from which the abdominal hairs spring. *d* Under side of the head. *e* Part of the side of the head at large, showing the antennæ, and position of the stemmata. The line in each figure is the natural size of the larva.

The power which the larva possesses of erecting the abdominal hairs when molested, as the porcupine does its quills, is remarkable. At first it was rather difficult to ascertain how this was accomplished; but upon examination, after removing the hairs from the larva, I found that the object was attained by an oblique movement of the four abdominal segments, to which these hairs are attached, somewhat after the fashion of the laths of a Venetian blind. These segments are furnished with a loose fold of skin on the under edge, to admit of the above movement.

I kept one of these larvæ for upwards of a month, in company with others of a voracious nature, and observed that, on any of the latter coming in contact with the longer hairs of this larva, it erected its abdominal brush, on which they receded; this fact seems to prove, that it is only by the sudden movement of the brush that the alarm is caused.

The long brush of hairs springing from the *telum*, or terminal joint of the abdomen, is also of service as a means of defence. When the larva is walking, it is always kept in a tremulous motion, and thus defends it from attack in the rear.

I would query whether the corneous abdominal segment, which is armed with spines in many of the Coleopterous larvæ,

may not be of use to the animal in somewhat the same way? These larvæ generally live in holes in decayed trees, which their body completely fills up; carnivorous larvæ, following in their track, would not be able to wound this part.

I know that, in one instance, it would be a perfect protection. I possess a small Coleopterous larva, which will fix its jaws in the soft skin of others, and there remain sucking until it is satisfied; after a little time it will repeat the operation, and this it will do until there is nothing left but the skin. Now this larva has not strength of jaws sufficient to wound these corneous segments.

The larva is found, during the winter months, under the loose bark of elm trees. I have found many of them, and invariably in company with a particular species of spider, which spins a web-like case, in which it lives, and *upon* which, I believe, the *Megatoma* larva feeds. Here we see the especial necessity for this protection, without which, I should think, it would soon be devoured by the spider.

I reared several specimens of this larva four or five years ago, but having misplaced the jar in which they were kept, did not see the pupa. When I found the jar, which was by accident, they had assumed the *imago* state;—the insect was dead.

Larva of Dasyses serricornis. Kirby. Plate X. fig. 1.

HEAD and tail pitchy black; body whitish, variegated with markings of a dull green hue. (Length, $1\frac{1}{2}$ lin.)

Head rotundate, rugose, with four whitish spots, two placed near the base on each side, and two anteriorly, behind the antennæ; just above, and between which and the antennæ, are two stemmata on each side. Antennæ short, three-jointed. Body elongate, soft and pubescent, gradually swelling towards the apex, which is armed with a corneous forked process.

Description of Figure.

a The larva magnified. *b* The head at large, showing the situation of the stemmata and white spots. *c* The telum.

The accompanying drawing was made from one of a number which I reared in the year 1828. I found the larva and pupa, about the beginning of March, in decayed blackthorn and

pear-trees; they assumed the imago state at the latter end of April.

Not having a specimen of the larva at present, I am unable to show the trophi at large. In habits and appearance, however, it is closely allied to those of *Thanasimus* and *Opilus*.

Larva of Orchesia micans. Lat. Plate X. fig. 2.

HEAD corneous; body soft, cylindrical, slightly pubescent, and of a pink colour. (Length, $1\frac{1}{2}$ lin.)

Head rotundate; antennæ very minute; labrum semicircular; mandibles short, slightly unidentate internally; maxillæ, with the blade, soft and fleshy, the apex sparingly furnished with spinous hairs; maxillary palpi three-jointed, the joints equal in length, terminal joint conic. Body elongate, cylindrical; all the joints are transverse, and nearly equal, excepting the telum, which is rather small, and semicircular.

Description of Figure.

a The larva magnified. *b* The pupa. *c* The head of the larva at large. *d* Mandible. *e* Maxilla. *f* Leg.

The larva is found, during the autumn, in *boletus* of the ash tree, and is generally in a bent position, and very sluggish, like those of the *Curculionidæ*. The pupa begins to partake of the activity of the perfect insect, riggling about very much when touched; its head is curiously dilated at the sides, and depressed.

ART. XXXVI.—*Two Letters, written by Mr. Addison, in the Year 1708, to the Earl of Warwick, (afterwards his Son-in-Law,) when that Nobleman was very young.*
Communicated by ARTHUR DAVIS, Esq.

[TO THE EDITOR OF THE ENTOMOLOGICAL MAGAZINE.]

SIR,—Some years since a friend of mine permitted me to transcribe two original letters from the celebrated Addison to his after-acquired son-in-law, the Earl of Warwick. I was, and am still, much delighted with the elegant simplicity which

pervades them, and having been assured that they have never yet met the public eye in print, I am inclined to think the subject of them is not absolutely unfit for the pages of a Magazine, so prominently identified with nature as the Entomological Magazine.

If you shall consider them worth insertion, they are at your service; but if not, please send me back the transcript, as it may save my copying them, perhaps, at a future time.

Believe me, yours, &c.

ARTHUR DAVIS.

Deptford, 22d July, 1834.

MY DEAR LORD, — I have employed the whole neighbourhood in looking after birds' nests, and not altogether without success. My man found one last night, but it proved a hen's, with fifteen eggs in it, covered with an old broody duck, which may satisfy your Lordship's curiosity a little, though I am afraid the eggs will be of little use to us. This morning I have news brought me of a nest that has abundance of little eggs, streaked with red and blue veins, that, by the description they give me, must make a very beautiful figure on a string. My neighbours are very much divided in their opinions upon them; some say they are a sky-lark's,—others will have them to be a canary bird's; but I am much mistaken in the colour and turn of the eggs if they are not full of tom-tits. If your Lordship does not make haste, I am afraid they will be birds before you see them; for, if the account they give of them be true, they can't have above two days more to reckon.

Since I am so near your Lordship, methinks, after having passed the day among more severe studies, you may often take a trip hither, and relax yourself with these little curiosities of nature. I assure you no less a man than Cicero commends the two great friends of his age, Scipio and Lælius, for entertaining themselves at their country-house, which stood on the sea-shore, with picking up cockle-shells, and looking after birds' nests. For which reason I shall conclude this learned letter with a saying of the same author, in his treatise of Friendship: "Absint autem tristitia, et in omni re severitas: habent illa quidem gravitatem; sed amicitia debet esse lenior

et remissior, et ad omnem suavitatem facilitatemque morum proclivior." If your Lordship understands the elegance and sweetness of these words, you may assure yourself you are no ordinary Latinist; but if they have force enough to bring you to Sandy-End, I shall be very well pleased.

I am, my dear Lord,

Your Lordship's most affectionate and obedient,

J. ADDISON.

May 20, 1708.

MY DEAREST LORD,—I can't forbear being troublesome to your Lordship whilst I am in your neighbourhood. The business of this is to invite you to a concert of music, which I have found out in a neighbouring wood. It begins precisely at six in the evening, and consists of a blackbird, a thrush, a robin-red-breast, and a bull-finch. There is a lark that, by way of overture, sings and mounts till she is almost out of hearing, and afterwards, falling down leisurely, drops to the ground, or as soon as she has ended her song. The whole is concluded by a nightingale, that has a much better voice than Mrs. Tofts, and something of the Italian manner in her divisions. If your Lordship will honour me with your company, I will promise to entertain you with much better music, and more agreeable scenes, than you ever met with at the Opera; and will conclude with a charming description of a nightingale out of our friend Virgil:—

Qualis populeâ mcerens Philomela sub umbrâ
Amissos queritur fœtus, quos durus arator
Observans nido implumes detraxit, at illa
Flet noctem, ramoque sedens, miserabile carmen
Integrat, et mœstis latè loca questubus implet.

So, close in poplar shades, her children gone,
The mother nightingale laments alone:
Whose nest some prying churl had found, and thence,
By stealth convey'd th' unfeather'd innocence:
But she supplies the night with mournful strains,
And melancholy music fills the plains.

Your Lordship's most obedient,

J. ADDISON.

May 27, 1708.

ART. XXXVII.—*Attempted Division of British Insects into Natural Orders.* By EDWARD NEWMAN.

Note.—In a few instances the connexions in the following arrangement would have been imperfect without an allusion to exotic genera; such exotic genera, or higher divisions, as may occur, are invariably inclosed by parentheses. In the following table those orders to which an asterisk is attached are merely designated, not described. The expression “Larva and pupa unknown,” simply signifies that they are unknown to the author, not to invalidate, in the slightest degree, descriptions which may have been given of them elsewhere.

TABLE OF THE ARRANGEMENT.

HEXAPODA TETRAPTERA.

AMORPHA

I. LEPIDOPTERA

Sphingina
Sphingites
Papilionina
Hesperites
Erycinites*
Colletes*
(Heliconiites)*
Papilionites
Nymphalites*
(Morphites)*
Geometrina
Geometrites
Noctuidina
Phytometrites
Catocalites*
Noctuites
Phalaenina
Aretiites
Bombycites
Phalaenites
Notodontites
Cossites
Egeriites
Pyrulina
Glaucopites
Pyalites
Crambites
Tineina
Yponomeutites
Tortricites
Tineites
Alucitites
—
Pulicites*

II. DIPTERA

Tipulina
Cecidomiites
Tipulites
Mycetophilites
Rhyphites
Bibionites
Scatopsites
Calicina
Simuliites
Sphaeromiites*
Ceratopogonites*
Culicites
Chironomites*
Corethrites*
Psychodites

Tabanina

Cyrtites
Bombyliites
Tabanites
Anthracites
Stomoxites
Conopites
Cestrites
Asilina
Leptites
Therovites
Asilites
Midasites
Empites
Tachydromiites
Dolichopites
Syrphina
Xylophagites
Stratiomites
Chrysotoxites
Syrphites
Eristalites*
Volucellites*
Rhingites*

Muscina

Muscites
Scatophagites
Tetanocerites
Tephritites
Phytomyzites
Phorites
Borborites
Hippoboscina
(Carnites)
Hippoboscites
Nycteribites
—
Styloplites

NECROMORPHA

III. HYMENOPTERA

Formicina
Formicites
Mutillites
Sphecina
Scholiites
Sapygites
Pompiliites
Sphecites
Larrites
(Bembicites)
Crabronites

Vespina

Vespites
(Masarites)
Apina
Lithurgites
Panurgites
Andrenites
Melliturgites
Apites
Apathites
Chrysites
Ichneumonina
Proctotrupites
Mymarites
Chalcites
Cynipites
Evanites
Ichneumonites
Braconites
Sirecina
Sirocites
Xyphidriites
Xyelites
Oryssites
Tenthredinina
Allantites
Hylotomites
Tenthredinites
Lydites
Cephites

IV. COLEOPTERA

Blapsina
Blapsites
Helopites
Mordellites
Pyrochroites
Cantharites
Anthicites
Buprestina
Ptinites
Clerites
Melyrites
Lampyrites
Cebionites
Elaterites
Buprestites
Scarabæina
Cetonites
Melolonthites
Trogites
Scarabæites
Lucanites

Histerites	Curculionites	<i>Nolonectina</i>
Byrrhites	Anthribites	Notonectites
<i>Silphina</i>	Salpingites	<i>Cicadina</i>
Dermestites		Cicadites
Ipsites	ISOMORPHA	<i>Coccina</i>
Nitidulites	V. ORTHOPTERA	Coccites
Silphites	<i>Forficulina</i>	<i>Aphina</i>
Spheridulites	Forficulites	Aphites
Hydrophilites	<i>Achetina</i>	—
Helophorites	Achetites	Aleyrodites
<i>Carabina</i>	<i>Gryllina</i>	—
Gyrinites	Gryllites	ANISOMORPHA
Dytiscites	<i>Locustina</i>	VII. NEUROPTERA
Carabites	Locustites	<i>Termitina</i>
Cicindelites	(<i>Spectrina</i>)	Termites
Staphylinites	(Spectrites)	<i>Perlina</i>
Pselaphites	(<i>Mantina</i>)	Perlites
Seydmanites	(Mantites)	<i>Raphidiina</i>
<i>Chrysomelina</i>	<i>Blattina</i>	Raphidites
Endomyceites	Blattites	<i>Hemerobina</i>
Coccinellites	—	Hemeroblites
Cassidites	Thyrpsites	<i>Phryganina</i>
Chrysomelites		Phryganites
Halticites	VI. HEMIPTERA	<i>Ephemerina</i>
Galerucites	<i>Cimicina</i>	Ephemerites
Criocerites	Cimicites	<i>Libellulina</i>
<i>Cerambycina</i>	<i>Hydrometrina</i>	Libellulites
Lepturites	Hydrometrites	—
Cerambycites	<i>Nepina</i>	Panorpsites
Cucujites	Nepites	
Bostricites		

DIVISION I.—TETRAPTERA AMORPHA.

Larva and pupa^a bearing no resemblance in external appearance to the imago. Pupa perfectly quiescent, having the organs of manducation and locomotion undeveloped.

SECTION I.—T. A. ADERMATA,

Which on entering the pupa state throw off the last skin of the larva, and consequently exhibit through the remaining skin the parts of the future imago.

CLASS I.—LEPIDOPTERA.

Larva with strong corneous mandibles, moving horizontally, and six articulated feet, situated in pairs on the second, third, and fourth segments: the fifth and sixth, eleventh and twelfth segments invariably with feet; the other segments each subject to the possession of a pair of fleshy prehensile feet: feeds on the leaves, bark, wood, or roots of vegetables. Imago with short, undeveloped, immovable labrum and mandibles; elongate palpigerous maxillæ, slender, flexible, and tubular; when at rest, convoluted between the labial feelers; labium triangular,

^a In a paper read in the course of last spring, at the Linnæan Society, I have attempted to prove that the pupa is not a distinct state, but simply the matured larva; the term is, however, convenient to express that matured state.

bearing two erect conspicuous feelers: all the wings fully and nearly equally developed, and, together with the body, clothed with scales: feeds on the honey of flowers, and on fruit.

STIRPS.—SPHINGINA.

NATURAL ORDER.—SPHINGITES, *Hawk-moths*.

Larva naked, of uniform substances, with ten prehensile legs, and a stout corneous recurved horn on the paratelum. Pupa smooth, rounded, generally quite naked; changes in or on the ground. Imago with the antennæ incrassated in the middle; the tips furnished with a recurved hook composed of fine bristles; wings narrow; hind wings small; body stout: flight rapid and well sustained; diurnal or nocturnal. *Sesia*, *Macroglossa*, *Smerinthus*, *Sphinx*, *Acherontia*, *Deilephila*, (*Castnia*,) &c.

STIRPS.—PAPILIONINA.

NATURAL ORDER.—HESPERITES, *Skippers*.

Larva generally naked, stout in the middle, and attenuated at the extremities with ten prehensile legs. Pupa stout, smooth, unangulated; changes in a loose web among the leaves on which the larva feeds, attached by the tail and a thread round the middle. Imago with the antennæ partially clavated; sometimes nearly filiform, hooked at the extremity; the hind wings of the insect, when at rest, reposing in a nearly horizontal position; the fore wings nearly erect; flight diurnal, brisk, and bustling. *Hesperia*, *Thymele*.

NATURAL ORDER.—PAPILIONITES, *Butterflies*.

Larva sometimes naked, but generally covered with down, hair, or spines; with ten prehensile legs. Pupa naked; mostly angulated, always attached by the tail; changes in the air. Imago with clavated antennæ not hooked; all the wings erect, and meeting above the back when at rest. *Polyommatus*, *Lycæna*, *Thecla*, *Amaryssus*, *Colias*, *Pontia*, *Apatura*, *Limenitis*, *Hipparchia*, *Vanessa*, *Argynnis*,^b &c.

^b This order appears to require further division, before we arrive at families; perhaps when we attain a more perfect knowledge of the anterior states of butterflies, they will be found to be divisible thus:—

NATURAL ORDERS.

- | | |
|--------------------|------------------|
| I. NYMPHALITES. | IV. ERYCINITES. |
| II. MORPHITES. | V. COLIITES. |
| III. HESPERITES. | VI. HELICONITES. |
| VII. PAPILIONITES. | |

STIRPS.—GEOMETRINA.

NATURAL ORDER.—GEOMETRITES, *Loopers*, or *Slender bodies*.

Larva naked, slender, and very elongate, with four prehensile feet; in consequence of the length of body without feet, its back is arched in walking. Pupa smooth, rounded; situation of change, various. Imago with antennæ tapering to a point; in the males often highly pectinated; wings ample, expanded; body very slender; flight in the evening, silent, feathery. *Geometra* and *Phalæna* of Haworth.

STIRPS.—NOCTUINA.

NATURAL ORDER.—PHYTOMETRITES, *Half-loopers*.

Larva naked, elongate, less slender than the preceding, with six prehensile feet; in walking its back is arched, but not so decidedly as in the preceding. Pupa smooth, rather pointed at the tail; changes in a slight web. Imago with filiform antennæ; small deflexed wings; moderately stout body; beautifully coloured: often with brilliant metallic markings; flight at all hours; in the hottest sunshine, and at midnight. *Plusia*, *Ophiusa*, *Heliothis*, *Acontia*, *Erastria*, *Phytometra*,^c &c.

NATURAL ORDER.—NOCTUITES, *Full-bodied Moths*.

Larva generally naked, cylindrical, robust, with ten prehensile feet;^d rolls in a ring when touched. Pupa smooth; mostly changes in the ground. Imago with filiform antennæ; occasionally pectinated in the males; wings small, deflexed; body stout and heavy; colour dusky; flight very rapid; nocturnal. *Brepha*, *Catocala*, and the *Noctuidæ*. *Noctua* and *Hemigeometra* of Haworth.^e

STIRPS.—PHALÆNINA.

NATURAL ORDER.—ARCHITES, *Millers*.

Larva very hairy; sometimes with bunches, brushes, or fascicles of hairs; with ten prehensile legs; rolls in a ring when touched.

^c This order corresponds with the genus *Phytometra* of Haworth; as he appears to have been the first, and indeed nearly the only author who considered it as decidedly distinct from the *Noctuites*, I have adopted his name.

^d Right only in a few.

^e The genus *Hemigeometra* of Haworth, including *Brepha* and *Catocala*, differs in having larger wings, a more slender body, brighter colours, diurnal flight, and a half-looping larva: it may possibly, hereafter, form a distinct order, under the name *Catocalites*. The *Geometrites* and *Noctuites* still require subdivision.

Pupa, more or less hairy; changes in a cocoon composed of silk, in which the hairs of the larva are always intermixed. Imago, the males with somewhat slender bodies; more or less pectinated antennæ, and active; often flying by day; the females very heavy, sluggish, and often apterous. *Acronycta* (part), *Spilosoma*, *Arctia*, *Hypercampa*, *Lithosia* (part), *Hypogymna*, *Laria*, *Orgyia*.^f

NATURAL ORDER.—BOMBYCITES, *Eggars*.

Larva elongate, cylindrical, of equal substance, hairy, with ten prehensile feet; rolls in a ring when touched. Pupa in a silken cocoon, more close than the preceding. Imago with pectinated antennæ in both sexes; males with slender bodies, very active, and fly by day: females heavy, sluggish, and seldom fly; predominating colour, fulvous. *Eriogaster*, *Odonestis*, *Gastropacha*, *Lasiocampa*.

NATURAL ORDER.—PHALÆNITES, *Emperor-moths*.

Larva obese, with fascicles of bristles disposed in rings on each segment. Pupa short, obtuse, flat, with bristles at the tail; changes in a tough pear-shaped cocoon, of which the smaller end remains open. Imago with highly pectinated antennæ in both sexes; wings amazingly expanded; the fore wings more or less falcate; beautifully coloured, and ocellated; body short and small; flight of the males diurnal, of the females rare, and mostly in the evening. *Saturnia*.

NATURAL ORDER.—NOTODONTITES, *Prominents*.

Larva generally naked; sometimes slightly downy; attenuated towards the tail, with eight prehensile feet; the two posterior ones being mostly wanting, and the segment usually bearing them elevated in the air. Pupa smooth, obese, compact; mostly changes in a cocoon or web, but occasionally on or in the ground. Imago with the antennæ of the males more or less pectinated; wings deflexed; flight, with few exceptions, in the evening. *Endromis*, *Cerura*, *Stauropus*, *Platypteryx*, *Cilix*, *Notodonta*, *Pygæra*, *Clostera*.

NATURAL ORDER.—COSSITES, *Wood-eaters*.

Larva depressed, rather attenuated towards either extremity; naked, except a few scattered hairs; prothorax flat and corneous; ten

^f Those in which the larva is furnished with brushes of hair, and in which the female imago is apterous, I have elsewhere treated as a separate order; the distinctions, however, seem of very doubtful value.

prehensile feet; feeds on the bark, solid wood, pith, or roots of vegetables. Pupa furnished with a double row of short spines on each segment; it changes in a tough cocoon amongst its food, after remaining through the winter in the larva state. Imago with the antennæ of the males more or less pectinated; flight nocturnal. *Hepialus*, *Cossus*, *Zeuzera*.

NATURAL ORDER.—ÆGERIITES, *Clear-wings*.

Larva and pupa, in habit and economy, precisely as in the preceding. Imago with antennæ incrassated externally, and the tip furnished with a slightly recurved hook, consisting of a few bristles; in the males ciliated; wings narrow, mostly transparent; body elongate, slender, and tufted; flight diurnal, in the hottest sunshine, and eminently graceful. *Ægeria*.[§]

STIRPS.—PYRALINA.

NATURAL ORDER.—GLAUCOPITES, *Burnet-moths*.

Larva obese, hairy, with ten prehensile legs. Pupa smooth, very glossy; changes in a close gummy cocoon, pointed at both ends, and attached generally to a blade of grass. Imago with clavate antennæ; slightly pectinated in the males. *Zygæna*, *Ino*.

NATURAL ORDER.—PYRALITES, *Pearl-moths*.

Larva rather more slender than the foregoing, slightly hairy, with ten prehensile feet. Pupa elongate, very lively; changes in a silken cocoon. Imago with filiform antennæ; wings somewhat triangular, deflexed: legs very long, and furnished with long spurs. *Ennychia*, *Pyrausta*, *Hydrocampa*, *Botys*, *Scopula*, *Pyralis*, *Polypogon*, *Hypena*.

NATURAL ORDER.—CRAMBITES, *Veneers*.

Larva elongate, naked, with ten prehensile feet. Pupa elongate; changes in a slight cocoon. Imago with very prominent labial feelers, filiform antennæ, sometimes pubescent; wings ample, folded round the body; flight in the evening. *Crambus*, and allied genera.

[§] The great difference between this and the preceding order, in the imago state, has induced me to propose this additional order.

STIRPS.—TINEINA.

NATURAL ORDER.—YPONOMEUTITES, *Ermine-moths*.

Larva elongate, slightly hairy, with ten prehensile feet; gregarious, spinning a web; if touched, runs backwards, falls and suspends itself by a thread. Pupa elongate, smooth; changes in a cocoon amongst its food. Imago with filiform antennæ; wings folded round the body, often beautifully dotted and marked with black. *Yponomeuta*, and neighbouring genera.

NATURAL ORDER.—TORTRICITES, *Bell-moths*.

Larva more obese than the foregoing, slightly hairy, with ten prehensile feet; gregarious, spinning a web; if touched, runs backwards with a rapid twisting motion, and falls, hanging by a thread. Pupa elongate, attached by the tail; changes in a silken cocoon, generally amidst the web of the larva. Imago with filiform antennæ; the fore wings with a prominent shoulder, which gives the insect, when at rest, precisely the shape of a bell. *Tortrix*, and allied genera.

NATURAL ORDER.—TINEITES, *Clothes-moths, &c.*

Larva elongate, with ten prehensile legs; concealed in a sack constructed by itself, which it enlarges from time to time as it increases in bulk; feeds on woollen cloths, hair, and decayed animal and vegetable substances. Pupa elongate; changes within the sack. Imago with filiform antennæ, and narrow wings; flight gregarious, rising and falling. *Tinea*, and allied genera.

NATURAL ORDER.—ALUCITITES, *Plume-moths*.

Larva slender, with ten prehensile feet; the anterior part capable of great attenuation and extension, in the manner of a leech. Pupa elongate; changes in a silken cocoon. Imago with filiform antennæ; wings extended at right angles with the body; very narrow, and divided to the base, each division having the appearance of a perfect and distinct feather. *Pterophorus*, *Alucita*.

NATURAL ORDER.—PULICITES, *Fleas*.

CLASS II.—DIPTERA.

Larva with minute but corneous mandibles, moving horizontally; without articulate or prehensile feet; feeds on recent or

decaying animal and vegetable substances. Imago with the parts of the mouth variously developed; the mandibles never possessing the horizontal motion, or masticatory power; the fore wings fully developed; the hind wings undeveloped; assuming the appearance of small pedunculated knobs, and denominated halteres or poisers; tarsi five-jointed.

STIRPS.—TIPULINA.

NATURAL ORDER.—CECIDOMITES, *Hessian-fly*, &c.

Larva elongate, inhabits and feeds on the blossoms of wheat and other grain, the leaves of plants, &c. causing excrescences. Pupa changes in the same situation, in a tough case. Imago usually with moniliform antennæ, as long as the body, composed of about twelve or thirteen joints in the female, and twice as many in the male; joints nearly globular, connected by a slender filament; maxillary feelers four-jointed; labium short, obtuse, and tomentose; other parts of the mouth obsolete; wings wide, as long as the body, which they cover horizontally; female furnished with an oviduct, frequently as long as the body. *Cecidomya*, *Campylomyza*.

NATURAL ORDER.—TIPULITES, *Crane-flies*.

Larva stout, very soft, attenuated anteriorly, abruptly terminated posteriorly; inhabits the earth, feeding on the roots of corn, grass, and other vegetables, or occasionally decayed wood. Pupa changes in the same situations; it has often two remarkable recurved horns projected from its head, through which it is said to breathe; and the segments of the body are mostly armed with spines. Imago with antennæ thirteen to seventeen-jointed; frequently pectinated in the males; labium fleshy, bilobed, dilated; maxillary feelers five-jointed, moderately long, curved, the points turning outwards; the other organs of the mouth nearly obsolete; ocelli none. *Ctenophora*, *Pedicia*, *Tipula*, *Erioptera*, *Limnobia*.

NATURAL ORDER.—MYCETOPHILITES.

Larva elongate, glabrous; inhabits and feeds on decaying fungi. Pupa changes in the same situations. Imago with antennæ sixteen-jointed, sometimes very long, moniliform, and simple in both sexes; labium and other organs of the mouth obscurely developed or obsolete; ocelli three; wings rather wide, cover the body

horizontally; body very slender, the same length as the wings; legs long. *Bolitophila*, *Macrocera*, *Synapha*, *Mycetobia*, *Platyura*, *Sciophila*, *Leia*, *Mycetophila*, *Molobrus*, *Lestrema*, *Zygoneura*.

NATURAL ORDER.—RHYPHITES.

Larva very elongate, smooth, cylindrical, encompassed by eleven corneous shining rings; head furnished with two hooks; tail with four short cylindrical tubes: inhabits the earth and cow-dung. Pupa changes in the earth. Imago with filiform, sixteen-jointed, antennæ, rather longer than the head; ocelli three; maxillary feelers four-jointed; labium distinctly bilobed, other parts of the mouth not fully developed; wings broad, lying horizontally on the body, which they much exceed in length. *Rhyphus*.

NATURAL ORDER.—BIBIONITES.

Larva elongate, attenuated at each extremity; divisions of the segments deeply marked, and fringed with hairs; head furnished with two obtuse hooks: inhabits earth, on which it appears to feed, no other substance being found in the intestines. Pupa changes in the earth. Imago with stout, nine-jointed, antennæ, not longer than the head; maxillary feelers four or five-jointed; labium pubescent and bilobed, the other parts of the mouth obsolete; head and eyes large in the male, small in the female; ocelli three; wings frequently opaque, lying horizontally on the body, which they equal in length. In the spring every lane and meadow swarms with these insects, either sailing in the air like balloons, or settled on flowers, vegetables, paling, walls, and even on the ground. *Bibio* (*Penthtria*), *Dilophus*.

NATURAL ORDER.—SCATOPSITES.

Larva and pupa unknown. Imago, with antennæ, cylindric-conic, acute, twelve-jointed; labium small, pubescent, and bilobed; maxillary feelers very short, exarticulate. Inhabits flowers; is sluggish in its movements. *Scatops*.

STIRPS.—CULICINA.

NATURAL ORDER.—SIMULITES, *Musquitoes*.

Larva aquatic; supposed to feed on vegetable substances; elongate, cylindrical, incrassated posteriorly, semi-transparent; two horns rise nearly in front of the head, and extend forwards; eyes or ocelli four; two fleshy prehensile legs appear to be placed beneath the mesothorax, and two more at the posterior extremity: its

motion in water is like that of a leech. Pupa also aquatic, but quiescent; ovate, gibbous, brown-coloured, clearly exhibiting all the parts of the future imago: four double filaments, nearly as long as the pupa, arise from the region of the prothorax on each side of the head; these are probably organs of respiration; the pupa is inclosed in a sheath, like a watch-pocket, the anterior portion alone being visible, the sheath being attached to some substance under the water. Imago, with antennæ, eleven-jointed, very short; maxillary feelers elongate, incurved, composed of four distinct joints, the fourth very long and pointed; the labrum, mandibles, and maxillæ sharp and wedge-shaped; the labium fleshy and bilobed; ocelli none; wings very wide, with stout costal nervures, and scarcely any elsewhere; legs short, and frequently hairy; tarsi four-jointed; mesothorax globose, very prominent; body short and small, colour black. Inhabits forests, woods, and all damp places, feeding on the blood of man and animals; and is perhaps the most annoying and wearisome persecutor with which mankind is acquainted. *Simulia*.

NATURAL ORDER.—CULICITES, *Gnats*.

Larva elongate, carnivorous, active, aquatic. Pupa equally active, but rather shorter, and the head and prothorax much incrassated. Imago, with fourteen-jointed antennæ, plumose in the males, hairy in the females; labium slender and elongate, forming, together with the mandibles, maxillæ, tongue, and labrum, (which are all fully developed, and as long as the labium,) a porrected blood-sucking apparatus; the maxillary feelers are long, divaricating, and clavate; all the organs of the mouth exceed the antennæ in length; ocelli none; wings linear, covering the body; body narrow, linear, elongate; legs very long. Inhabits woods, &c. entering houses; feeds on the blood of man and quadrupeds. *Culex*, *Anopheles*, (*Ædes*), *Chironomus*?^b *Corethra*? *Tanytus*? *Ceratopogon*? *Sphæromias*? The last five genera differ much in the antennæ, mouth, &c. and properly form several distinct orders.

NATURAL ORDER.—PSYCHODITES, *Moth Gnats*.

Larva and pupa unknown. Imago, with antennæ, filiform, and perfectly simple, alike in both sexes; labium short, entire,

^b The order *Culicites* appears to require division. The British *Culicina* may probably be divided thus: *Psychodites*, *Corethrites*, *Chironomites*, *Culicites*, *Ceratopogonites*, *Sphæromyites*, *Simuliites*.

somewhat pointed; wings deflexed, very hairy, enveloping the body laterally, and their inner margins uniting above it. *Psychoda*.

STIRPS.—TABANINA.

NATURAL ORDER.—CYRTITES, *Bald-headed Flies*.

Larva and pupa unknown. Imago, with antennæ entirely concealed, so that the head appears perfectly globular; they are situated below the eyes, are very small, and seven-jointed; the basal joint is short and small, the second stout, and the remaining five united into one, which is very acute at the apex, and somewhat incrassated at the base: labium, as in the *Bombiliites* (but much smaller, shorter, and less obviously porrected), a slender elongate tube; ocelli three; wings longer than the body, but too narrow to cover it; alulæ large; prothorax and body very globose. Inhabit white thorn, furze, rushes; very seldom fly, and appear exceedingly sluggish. The body in the British genera is so soft as to indent on the slightest pressure. *Henops*, *Acrocera*. (*Cyrtus*).

NATURAL ORDER.—BOMBILIITES, *Unicorn Flies*.

Larva and pupa inhabit the earth; their habit and economy is imperfectly known. Imago, with antennæ, composed of seven joints; the basal and second joint short; the apical portion long, linear, and consisting of five united joints, of which the terminal one is acute; labium very long, rigid, and porrected like a horn; ocelli three; wings widely divaricating, narrow, variegated; alulæ small; legs long, slender; body short, globose, very hairy. Inhabits lanes and woods, hovering over flowers, occasionally suspended motionless in the air, and then darting away with such inconceivable velocity that no eye can follow it. *Bombylius*, (*Usia*).

NATURAL ORDER.—TABANITES, *Gadflies*.

Larva inhabits the earth; is elongate, cylindrical; head corneous, linear, elongate, and furnished with two hooks. Pupa changes in the earth; has two tubercles anteriorly, and six sharp points near the posterior extremity. Imago, with antennæ composed of seven joints, the basal joint long and rather stout, the second minute, the remaining five of various dimensions and sizes, differing in the different genera, but also closely connected, and

corresponding apparently with the apical seta of the *Muscina*; labium large, bilobed, porrected; and the other organs of the mouth very perfectly developed; ocelli none; wing divaricating, as long as the body; alulæ large; body flat; colour griseous: male feeds on the farina of flowers; females suck the blood of man and quadrupeds. *Tabanus, Hæmatopota, Chrysops.*

NATURAL ORDER.—ANTHRACITES.

Larva and pupa unknown. Imago, with the antennæ composed of seven joints; the basal joint long and stout, the second globular, and the remaining five frequently united into one; labium large, fleshy, bilobed, and rather porrected; the other organs less perfect than in the *Tabanites*; ocelli three; wings somewhat divaricating, long, extending beyond the body, beautifully variegated with black or brown; alulæ small; body flattened, truncate at the extremity. Inhabits the borders of woods, heaths, &c. settling, on flowers, on the farina of which it probably feeds. *Anthrax, Stygia.*

NATURAL ORDER.—STOMOXITES.

Larva and pupa unknown. Imago, with the antennæ six-jointed; the basal and second joints short, the third produced inferiorly, pendulous, and received into a cavity in front of the head; the remaining joints forming a seta which is often plumose; labium very elongate, and porrected in front of the head; wings slightly divaricate; alulæ very large; body stout; colour griseous or mottled. Inhabits woods, meadows, houses, &c. feeding on the pollen of flowers and the blood of man and quadrupeds; particularly annoys horses, piercing its porrected labium through their skin; and, seeking shelter in the dwellings of man as winter approaches, draws his blood even through a worsted stocking. *Stomoxys, Bucentes.*

NATURAL ORDER.—CONOPITES.

Larva elongate; feeds on the bodies of humble bees. Pupa changes in the same situations. Imago, with antennæ placed on a distinct pedicle, six-jointed; basal joint long, second and third long and incrassated, the remaining ones short and decreasing to a point; labium long, porrected; wing narrow, divaricating; alulæ obsolete; body elongate, narrow, recurved. Inhabits woods, feeding on composite flowers, and occasionally, it is said, sucking the blood of cattle. *Conops, Myopa, and Zodion* differ essentially in the antennæ and alulæ, but perhaps belong to this order.

NATURAL ORDER.—ÆSTRITES, *Botts*.

Larva cylindrical, oblong; feeds in the stomachs, frontal cavities, or backs of quadrupeds; when full fed it falls to the ground. Pupa changes in the earth, or, if the larva inhabit the stomach, in the dung of the animal it has preyed on. Imago, with six-jointed antennæ; basal and second joints short, scarcely distinct; third large, globose; the remaining three forming a seta, which is incrassated at the base; organs of the mouth obsolete; wings divaricating; alulæ moderately large; body pilose, short, stout. Inhabits meadows and commons, flying about cattle, and causing them much uneasiness; this is done in order to deposit its eggs, not for the purpose of attacking them: it takes no food. *Æstrus*, *Cuterebra*.

STIRPS.—ASILINA.

NATURAL ORDER.—LEPTITES.

Larva elongate, rather attenuated at the anterior end; inhabits funnel-shaped holes, which it constructs in loose sand, to serve as a pitfall to small insects, on which it feeds; the larva remains perfectly motionless when waiting for its prey, and so nearly resembles the surrounding soil in colour, that it is effectually concealed from observation. Pupa changes in the same situation. Imago, with antennæ five-jointed; the basal, second, and third joints short, and somewhat globose, but varying much in the genera; the fourth and fifth closely united, and forming a long, slender seta; labium large, membranous, bilobed; the maxillary feelers long, two-jointed, and porrected; ocelli three; wings long, divaricating, often spotted; alulæ obsolete; body moderately long. Inhabits moist hedges, banks of rivers, &c.; flight short, weak; preys on small insects. *Leptis*, *Atherix*, *Rhagio*.

NATURAL ORDER.—THEREVITES.

Larva very elongate, with two air-tubes at the posterior extremity, and the divisions of its segments very distinct; inhabits moist sand, mud and moss. Pupa changes in the same situations. Imago, with the antennæ composed of seven joints; the basal joint longer than the second, the remaining five united into one, which is acute at the apex; the labium is short, linear, and bilobed; the wings cover the body; alulæ obsolete; body very hairy. Inhabits the sand of the sea shore, roads, &c. making short flights: preys on small insects. *Thereva* (*Chryomyza*.)

NATURAL ORDER.—ASILITES.

Larva inhabits the earth; it is elongate, cylindrical, slightly depressed, very smooth, and has a corneous head, which is slightly clothed with down, and armed with two hooks; the prothorax and paratelum have each a pair of spiracles: feeds on the minute insects which abound near the surface of the ground, especially at the roots of grass. Pupa changes in the same situation, without spinning any cocoon; it is very smooth, anteriorly cylindrical, posteriorly conical; the head has a bifid projection in front, and on each side below this is a trifid excrescence; the prothorax has on each side a tubercle, which seems to contain a spiracle; the body laterally, and at the extremity, is furnished with small spines. Imago, with the antennæ five-jointed; the basal and second joints moderately long, the three forming the apical portion always distinct; the terminal joint acute, but not setiform; labium large, cylindrical, and corneous; ocelli three; wings as long as the body, which they cover horizontally; alulæ obsolete; body elongate, hairy. Inhabit heath and commons very abundantly, flying a short distance at a time, settling on the ground, and preying on other insects, particularly *Diptera*. *Dasypogon*, *Asilus*, *Gonipes*.

NATURAL ORDER.—MIDASITES.

Larva and pupa unknown. Imago, with the antennæ five-jointed; the basal joint long, the second short and nearly globular, the three forming the apical portion united into an elongate, stout club, on which the union of the joints is marked transversely; labium longer and more acute than in the *Asilites*; maxillæ and mandible acute; ocelli nearly obsolete; wings as in the *Asilites*; legs and body hirsute. Inhabits woods, forests, settling on leaves, &c. preying voraciously on insects, particularly *Hymenoptera*. *Dioctria*? *Laphria*? (*Midas*.)

NATURAL ORDER.—EMPITES.

Larva and pupa unknown. Imago, with antennæ five-jointed; the basal joint oblong, the second nearly globular, the three forming the apical portion often united, of different proportions in different genera; labium very long, slender, recurved, contains elongate and acute maxillæ, &c. resembling very much the beak of a bird; ocelli three; wings large, particularly wide in the female; alulæ small or obsolete; body rather hairy, linear, slender. Inhabits woods, lanes, and gardens, preying on other insects. *Hilara*, *Gloma*, *Empis*, *Rhamphomyia*, *Hybos*.

NATURAL ORDER.—TACHYDROMITES.

Larva and pupa unknown. Imago, with antennæ five-jointed; the basal and second joints oblong, the third elongate and robust, the fourth and fifth forming a seta, which is bent nearly at a right angle with the third; labium short, bilobed; ocelli three; wings very large and wide, lying horizontally on the back; body rather pilose, short, stout, pointed. Inhabits woods, hedges, and umbellate flowers, preying on dipterous and minute hymenopterous insects; black, brown, or fulvous. *Hemerodromia*, *Tachydromia*, *Platypalpus*, *Drapetis*.

NATURAL ORDER.—DOLIPOCHITES.

Larva attenuate at the extremities, elongate; inhabits moist earth and mud. Pupa changes in the same situations, having all the parts of the perfect insect distinctly visible. Imago, with the antennæ five-jointed; the basal, second and third joints robust, the fourth and fifth forming a seta: labium very stout, short, and bilobed; ocelli three; wings very large, lying horizontally over the body; alulæ obsolete; legs very long; body short and small; colour beautifully metallic green, often with a silvery pilosity. Frequents ponds and damp places in woods, preying upon small insects. *Porphyrops*, *Chrysotus*, *Dolichopus*, *Medeterus*, and several minor genera separated from these.

SECTION II.—T. A. DERMATA.

Which, on entering the pupa state, do not throw off the last skin of the larva, and consequently do not exhibit in any degree the parts of the future imago.

STIRPS.—SYRPHINA.

NATURAL ORDER.—XYLOPHAGITES.

Larva elongate, inhabits decaying wood. Pupa changes in the same situations: in a cocoon. Imago, with the antennæ ten-jointed; the basal and second joint are short, moderately robust, and hairy; the portion corresponding to the apical seta of the *Muscina* is robust, and composed of eight distinct joints; labium large, fleshy, and pilose; ocelli three; wings horizontally covering the body; alulæ none; hind tarsi often dilated in the males; body linear, very depressed. *Xylophagus*, *Actina*, *Beris*.

NATURAL ORDER.—STRATIOMITES.

Larva very elongate, attenuated at the anterior end, composed of twelve very distinct segments, besides the head; inhabits the water. Pupa changes on the surface of the water, and continues floating: no material alteration in the form takes place. Imago, with the antennæ eight-jointed; the basal and second joint are uniformly robust and hairy, the remaining six are variously formed in the genera, and sometimes indistinct; the labium is large, fleshy, and bilobed; the other organs of the mouth minute and nearly obsolete; ocelli three; wings narrow, reposing one on the other, and seldom wholly covering the body, which appears on each side; alulæ obsolete; body very flat, short, and wide. Flies in the sunshine, settling on leaves and flowers. *Stratiomys*, *Odontomyia*, *Oxycera*, *Nemotelus*, *Sargus*.

NATURAL ORDER.—CHRYSOTOXITES.

Larva and pupa unknown; the former supposed to feed on the roots of corn, &c. Imago, with the antennæ six-jointed; basal and second joint long and slender, third very long and more robust, the remaining three forming a slender and perfectly uniform seta, which arises from near the base of the third; labium large, much dilated, bilobed; wings divaricating; alulæ small or obsolete; body very stout, convex above. Inhabit woods, &c.; fly briskly in the sunshine, settling, the males on umbellate flowers, the females on leaves. *Microdon*, *Chrysotoxum*. *Psarus*? *Paragus*?

NATURAL ORDER.—SYRPHITES.¹

Larva always elongate, but of a variety of forms; feeds on *Aphites*, larvæ of bees and wasps, small water insects, &c. &c. Pupa changes in the habitat of the larva, excepting when aquatic; it then leaves the water, and attaches itself to some tree, wall, paling, or other vertical substance. Imago, with the antennæ six-jointed; the basal and second joint short and small, the third very large and nearly globose, the remaining three forming a perfectly uniform seta, often plumed; labium always terminated by two large, long and very distinct lobes; the other organs of the mouth distinct and fully developed; ocelli three; wings wider than in the *Stratiomites*, slightly divaricated; body convex above. Fly in the sunshine, feeding on flowers. *Ascia*, *Sphegina*, *Baccha*,

¹ The order SYRPHITES appears to require further division into *Syrphites*, *Eristalites*, *Volucellites*, and *Rhingites*.

Eumerus, Psilota, Chrysogaster, Pipiza, Cheilosia, Scæva, Syrphus, Eristalis, Helophilus, Tropidia, Xylota, Spilomyia, Milesia, Merodon, Criorhina, Sericomyia, Volucella, Brachiopa, Rhingia.

STIRPS.—MUSCINA.

NATURAL ORDER.—MUSCITES, *Flies.*?

Larva obese, but capable of great elongation and attenuation anteriorly; inhabits and feeds on dung, putrid flesh and vegetables, bark and roots of trees, recent and putrescent fungi, and the larvæ of other insects. Pupa changes in similar situations, oblong, perfectly uniform and rounded as though turned in a lathe. Imago with the apical seta of the antennæ tri-articulate; labium elongate, dilated at the extremity, retractile; alulæ of the wings distinct and conspicuous; body hairy; form obese; colour black, brown, or grey, with metallic green and blue. *Phasia, Gymnosoma, Phania, Miltogramma, Gonía, Trixa, Tachina, Echinomyia, Melanophora, Leucostoma, Metopia, Exorista, Eriothrix, Ocypteryx, Dexia, Mesembrina, Sarcophaga, Musca, Anthomyia, Cænosa, Lispe*, and the numerous genera which have been separated from these.

NATURAL ORDER.—SCATOPHAGITES, *Dung-flies.*

Larva inhabits dung, fungi, putrid substances, and the pith of plants. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ obscurely triarticulate; labium elongate, slightly recurved, scarcely dilated, retractile; alulæ of the wings very minute; body very hairy; form oblong; colour yellow. *Scatophaga, Dryomyza, Sapromyza.*

NATURAL ORDER.—TETANOCERITES.

Larva inhabits moist plants, fruits, putrid substances, also mud at the banks of ponds, rivers, and all wet places. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ exarticulate; labium short and broad; alulæ of the wings wanting; wings narrow; form elongate, often very slender: glabrous, not hairy; colour black, black with yellow spots, brown or yellowish. *Ortalis, Sepsis, Lonchæa, Luuxania, Ulidia, Piophila, Psila, Calobata, Micropeza, Tetanocera, Loxocera, Heteromyza, Platyccephala, Sciomyza, Lucina, Chryliza, Lissa, Platystoma, Sepedon, Dorycera*, and the genera separated from these.

NATURAL ORDER.—TEPHRITITES.

Larva inhabits galls or excrescences on the bark and leaves of plants. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ exarticulate; labium large, fleshy, bilobed, and pilose; alulæ of the wings wanting; wings rather wider than in the preceding order, beautifully variegated, striped and spotted with different shades of black and brown; body glabrous, of moderate length and stoutness, and, in the females, furnished with a large exerted and conspicuous ovipositor. *Tephritis*.

NATURAL ORDER.—PHYTOMYZITES.

Larva inhabits the interior of plants and fruits, and sometimes putrid substances. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ exarticulate; labium large, fleshy, clavate; alulæ of the wings wanting; wings as wide as in the preceding order; the body very delicate, often very slender, glabrous; colour black, or black variegated with yellow. *Phytomyza*, *Chlorops*, *Meromyza*, *Agromyza*, *Discomyza*, *Gymnopa*, *Asteia*, *Drosophila*, *Ochthiphila*, *Opomyza*.

NATURAL ORDER.—PHORITES.

Larva inhabits the flowers and seeds of vegetables, and the larvæ of other insects. Pupa as in the *Muscites*. In the imago the apical seta of the antennæ is composed of four joints, the three basal ones being very short, the apical one very long; labium very short; alulæ of the wings wanting; wings very wide, extending beyond the body, which is very small, acute at the extremity, and in colour inclining to black or yellow. *Phora*.

NATURAL ORDER.—BORBORITES.

Larva inhabits putrid animal and vegetable substances. Pupa as in the *Muscites*. Imago, with the apical portion of the antennæ, perfectly simple and exarticulate, sometimes orbicular; labium large, membranous, and bilobed; alulæ of the wings wanting; wing very large and wide; body very small, and of a black colour. *Borborus*, *Ochthera*, *Dichæta*, *Ephydra*, *Notiphila*, *Homalura*, *Orygma*, *Cælopa*.

STIRPS.—HIPPOBOSCINA.

(NATURAL ORDER.—CARNITES.

Larva and pupa unknown. Imago, with antennæ, consisting of a minute tubercle, situate in a fovea before the eyes; mandibles

unknown; maxillæ short, their feelers apparently exarticulate, short, erect; ocelli none; fore-wings short, not formed for flying; hind-wings assuming the form of halteres, small, but distinct. Inhabits the common starling. The only species at present described is *Carnus hæmapterus*.)

NATURAL ORDER.—HIPPOBOSCITES.

Larva, apod and nearly spherical, is nourished and attains perfection in the ovary of its parent. Pupa changes in the same situation, and is produced in the state in which it undergoes the final change; its structure is nearly as in the *Muscina*, excepting an evident indentation at the end, which becomes the lower extremity of the future imago. Imago, with triarticulate antennæ, the second joint most developed, and the third originating in a hollow or socket near the base of the second; mouth apparently adapted for suction, its component parts appear to be two mandibles, two maxillæ, and a sheath-like labium; tarsi five-jointed; occasionally with the fore-wings developed, and the hind-wings appearing as poisers. Infects quadrupeds and birds. *Hippobosca*, and the genera separated from it.

NATURAL ORDER.—NYCTERIBITES.

Larva and pupa as in the preceding order. Imago, with the antennæ, obsolete; the mouth situated on the back of the prothorax, in which the head seems sunk; parts of the mouth obsolete or unascertained; wings entirely obsolete; legs, with the femora and tibiæ, each two-jointed, the tarsi five-jointed. Infests bats. *Nycteribia*. Authorities for these characters, Leach and Latreille; they are not written from actual investigation, and appear somewhat unsatisfactory.

Situation at present doubtful.

NATURAL ORDER.—STYLOPITES, *Bee-parasites*.

Larva apod, with a hard corneous head; inhabits the bodies of bees in the imago state, feeding on those parts not positively essential to life. Pupa changes in the same situation. Imago, when hatched, comes from between the segments of the body, generally between the protelum and paratelum; antennæ six-jointed, the joints variously developed in the genera; labrum distinct; mandibles linear and rigid; maxillæ less developed, each bearing an exarticulate feeler; labium triangular and pointed, bearing no

feeler; eyes large, hemispherical, granulated, and distant; ocelli none; head broader than long; prothorax very short; mesothorax very large; fore-wings ample, folded longitudinally; alulæ none; before these are two patagia or tippets, similar to those of *Lepidoptera*, being naked, pedunculate processes, which the insect can move rapidly at pleasure; hind-wings obsolete; tarsi five-jointed. (*Xenos*.) *Stylops*, *Elenchus*, *Halictophagus*.

DIVISION II.—TETRAPTERA NECROMORPHA.

Larva bearing no resemblance to the imago. Pupa perfectly quiescent, having the organs of locomotion and manducation confined by a shell-like skin; yet displaying all the limbs and organs, placed in order by the sides of the body, and detached from it, except at the usual points of connexion.

CLASS III.—HYMENOPTERA.

Larva with small corneous mandibles, moving horizontally; in one stirps, with six articulate, and twelve to sixteen prehensile, feet; in the remaining stirps, without feet. Feeds on a composition provided by the imago (Stirps I. and III.); the putrefying bodies of other insects (Stirps II.); honey and pollen (Stirps IV.); the fleshy parts of living insects (Stirps V.); the wood of dead trees (Stirps VI.); or the leaves of living vegetables (Stirps VII.) Imago, with the mandibles strong, moving horizontally, and masticatory; the other organs of the mouth fully developed; three ocelli; wings all developed, the fore- exceeding the hind-wings in size, membranaceous, and used in flying; the mesothorax largely developed at the expense of the pro- and metathorax; the podoon mostly restricted; the tarsi five-jointed. Food very various.

STIRPS.—FORMICINA, *Ants*.

NATURAL ORDER.—FORMICITES, *Social Ants*.

Larva an inactive, obese, voracious maggot, residing entirely in the earth, and dependant for food on the care of the perfect insects. Pupa changes in a tough leathery cocoon; these cocoons are commonly known as "ants' eggs." Imago, with the antennæ, composed of about thirteen joints, often elbowed, slightly incrassated exteriorly; mandibles somewhat triangular, toothed; maxillæ obtuse; labium short, obtuse, its ligula not produced;

maxillary and labial feelers fully developed and distinctly articulate; fore-wings ample; hind-wings small; lives underground in immense societies, consisting of three kinds of individuals, males, females, and abortive females; the latter differ from the two former in wanting wings, and in having the pro-, meso-, and metathorax of nearly uniform development. *Formica*. (*Polyergus*, *Odontomachus*, *Ponera*), *Myrmica*, (*Eciton*, *Atta*, *Cryptocerus*).

NATURAL ORDER.—MUTILLITES, *Solitary Ants*.

Larva and pupa unknown. Imago, with antennæ composed of about thirteen joints, not elbowed, rather attenuated exteriorly; mandibles long, dentate at the apex; maxillæ obtuse; labium short, obtuse, its ligula not produced; maxillary and labial feelers fully developed and distinctly articulate; ocelli indistinct or wanting; wings possessed by the males only; females usually with the pro-, meso-, and metathorax equally developed; abortive females none. Inhabits sandy situations, is solitary. (*Dorylus*, *Labidus*, *Apterogyna*, *Psammotherna*.) *Mutilla*, *Myrmosa*, (*Myrmecoda*, *Scleroderma*.) *Methoca*. This and the preceding order require subdivision.

STIRPS. — SPHECINA, *Sand-wasps*.

NATURAL ORDER.—SCHOLITES.

Larva an elongate inactive maggot; inhabits a burrow or hole made in the sand by its parent, and feeds on the larvæ or imagines of other insects which she has provided for its sustenance. Pupa changes in a silken cocoon spun by the larva at the bottom of its domicile. Imago, with antennæ composed of about thirteen joints, very short, recurved, almost forming a ring; mandibles short, strong, dentate; maxillæ long, their feelers also long; labium longer than in the *Formicina*; its ligula trilobed; ocelli three, distinct; wings alike in both sexes; legs short, stout, spiny; female with a pungent sting. Solitary; inhabits sandy districts, settling occasionally on umbellate flowers; feeds on insects. *Tiphia*, (*Myzina*, *Meria*, *Scholia*.)

NATURAL ORDER.—SAPYGITES.

Larva and pupa supposed to be as in the preceding order. Imago, with antennæ composed of about thirteen joints, exteriorly incrassated, particularly in the males, longer and more robust than in the preceding order; mandibles, labium, &c. nearly as in the

Scholiites; ocelli three, distinct; wings alike in both sexes; legs short but slender, and without spines; female with a sting. Solitary; female inhabits walls, palings, and posts; male settles on umbellate flowers. (*Thynnus*, *Polochrum*), *Sapyga*.

NATURAL ORDER.—POMPILITES.

Larva and pupa as in *Scholiites*, the food of the former consisting frequently of spiders provided by its parent. Imago, with antennæ composed of about thirteen joints, more long and slender than in the two preceding orders, attenuated exteriorly, and mostly recurved; mandibles long, dentate at the apex; labium short, with its ligula short and trilobed; ocelli three, distinct; wings alike in both sexes; legs long, spiny; female armed with a sting; inhabits all sunny banks in sandy situations, running with great activity, and continually vibrating its antennæ and wings; feeds on insects. *Ceropales*, *Pompilus*, (*Planiceps*.) *Aporus*.

NATURAL ORDER.—SPHECITES.

Larva and pupa as in *Scholiites*, the food differing only in the kind of insect provided. Imago, with the antennæ composed of thirteen joints, short and recurved in both sexes; mandibles very long, acute; maxillæ very long, obtuse at the apex of their lacinia; labium, with its ligula, elongate, bifid, and flexible; ocelli three; podoon elongate and very slender, whereas in the three preceding orders it is very short; legs long. Inhabits sandy situations, flying heavily, but running with agility, and feeding on insects. (*Dolichurus*, *Pelopæus*), *Ammophila*, (*Sphex*).

NATURAL ORDER.—LARRITES.

Larva and pupa as in the *Scholiites*, the former frequently feeding on *Cimicites*, provided for it by its parent. Imago, with antennæ composed of thirteen joints, shorter in the females than the males, and often incrassated exteriorly; mandibles less elongate than in the *Sphécites*, and bifid at the apex; maxillæ very obtuse; labium short, its ligula short, obtuse, and bilobed; ocelli three; podoon generally short and indistinct; legs moderately long. Inhabits sandy situations, occasionally umbellate flowers; is fond of settling on stones, leaves, &c.; feeds on insects. *Gorytes*, *Psen*, *Larra*, *Lyrops*, *Dinetus*, *Trypoxylon*, *Oxybelus*.

(NATURAL ORDER.—BEMBECSITES.

Larva and pupa as in the *Scholiites*, the food provided for the larva consisting of *Syrphina* and *Muscina*. Imago, with

antennæ thirteen-jointed, elbowed at the second, short, and of nearly uniform substance; &c. &c. *Bembex*, *Monedula*.)

NATURAL ORDER.—CRABRONITES.

Larva and pupa as in the *Scholiites*, excepting that in this order many are frequently found in the same burrow. Imago, with antennæ thirteen-jointed, short, and slightly incrassated externally; mandibles long, acute, and terminating in a single point; maxillæ obtuse; labium elongate, its ligula short, dilated, obtuse, and terminating in four lobes; ocelli three; head very large, square; legs short and stout, fore-legs often patellated; body, with its greatest diameter, about the ninth segment, very glabrous, black, or black and yellow. Inhabits sandy banks, settling on leaves, stones, and umbellate flowers. *Cerceris*, *Philanthus*, *Crabro*, *Rhapalum*, *Stigmus*.

STIRPS.—VESPINA, Wasps.

NATURAL ORDER.—VESPITES.

Larva an obese inactive maggot, inhabiting a cell provided by its parent, who supplies it with food, consisting of honey, pollen, &c. Pupa changes in a silken cocoon, which the larva spins in its cell. Imago, with antennæ composed of twelve joints in the female, thirteen in the male, slightly elbowed at the second joint; eyes somewhat reniform, the indented portions facing each other; ocelli three; upper-wings folded longitudinally; pœdon slender, but short; eighth segment largest, both as to length and breadth. Live commonly in societies composed of three kinds of individuals, males, females, and abortive females; the two last are furnished with stings: inhabit all climates and all situations, devouring almost every article capable of affording nutriment, but particularly fond of sugar, fruits, the flesh of animals and living insects. *Vespa*, *Eumenes*, *Odynerus*, *Epipone*.

(NATURAL ORDER.—MASARITES.

Larva and pupa as in the *Vespites*. Imago, with the antennæ composed of thirteen joints, of which the five terminal ones are closely united and form a club; wings as in the *Vespites*, &c. *Masaris*, *Chelonites*.)

STIRPS.—APINA, Bees.

NATURAL ORDER.—OSMIITES.

Larva an obese inactive maggot, deposited as an egg in the midst of a semi-fluid substance, composed of honey and pollen, collected

by its parent, and stored in cells which are constructed for the purpose, mostly in timber which is going to decay; these cells are sometimes crowded together without order, but mostly regularly following each other in a cylindrical tube, composed of wax, leaves, mortar, and a variety of substances; this cylindrical tube being constructed in, and closely fitted to, a perforation made in the timber for the purpose, as the perforation passes completely through the substance of the timber, the larvæ which are first deposited, and consequently first become pupæ and perfect insects, escape one after another without disturbing those above them. Imago, with antennæ thirteen-jointed in the female, fourteen-jointed in the male; they are slightly elbowed at the second joint, which is much longer than the others; the blade of the maxillæ is elongate and somewhat falcate; the maxillary feelers are minute, and generally composed of six indistinct joints; the labium has its ligula variously developed; it is always trilobed, but the central lobe, though always elongate, varies in the proportion it bears to the labial feelers; the lateral lobes are very minute, short, and acute; the labial feelers have the basal joint long, the second longer, the third and fourth short, somewhat conical, and forming an angle with the second; the hind-tibiæ are not formed for collecting pollen, but the body of the female is clothed beneath with a thick covering of hair, which serves for this use. *Anthidium*, *Megachile*, *Osmia*, *Heriades*, *Chelostoma*, *Ceratina*?

NATURAL ORDER.—PANURGITES.

Larva and pupa, as far as the British genera are concerned, unknown. Imago, with antennæ thirteen-jointed in the females, fourteen-jointed, and somewhat moniliform, in the males; maxillæ with the blade lanceolate and of moderate length; the maxillary feelers of equal length, and six-jointed; labium, with the ligula trilobed, the central lobe about equal to the true lip in length, the lateral lobes very short and acute; the labial feelers with four joints, varying but slightly in length from each other; the feelers exceed the ligula in length; wings large, flight slow; insect inactive; economy unknown; body rather stout; black, hairy. Inhabits in immense abundance the flowers of *Leontodon*, *Hieracium*, and other similar composite plants, in August and September. *Panurgus*. (*Systropha*, *Xyocopa*,) &c. are closely allied; the latter insect's economy nearly approaches that of *Ceratina* in the preceding order.

NATURAL ORDER.—ANDRENITES.

Larva inhabits a long tortuous burrow, formed by its parent in the ground; a small heap of earth, produced in excavating which, may almost invariably be observed at the mouth of the burrow; feeds on a globular pellet of pollen, collected, moistened, and kneaded into a consistent mass, by the parent. Pupa changes in the earth. Imago, with antennæ thirteen-jointed in the female, fourteen-jointed, and of much greater length, in the male, elbowed, particularly in the females, at the second joint; maxillæ with the blade somewhat obtuse, and no longer than the maxillary feeler, which is distinctly six-jointed; labium, with the ligula very short, and quadrilobed, the lateral lobes usually equalling the internal ones in length; hind-tibiæ formed for collecting pollen. Inhabits sunny banks, and flies incessantly about hedges and evergreens in the spring; is gregarious, but each pair has its proper nest. Two kinds of individuals only. *Colletes*, *Dasy-poda*, *Andrena*, *Halictus*, *Sphecodes*.

NATURAL ORDER.—MELLITURGITES.

Larva inhabits nests constructed by its parent, either in the ground or against a bank or wall, and consumes pollen provided by its parent, and stored up at the time the egg is deposited. Pupa changes in a silken cocoon in the same situation. Imago, with antennæ thirteen-jointed in the female, fourteen-jointed in the male, elbowed at the second joint; maxillæ, with the blade lanceolate, elongate; the maxillary feelers six-jointed and setaceous; labium, with its ligula, trilobed, central lobe very long, obtuse, pubescent, lateral lobes not more than a fourth of its length, very acute; ligula, labial feelers, and blade of maxillæ, nearly corresponding in length; hind-tibiæ formed for collecting pollen; body short, robust; wings small; economy not social. Two kinds of individuals only, both of which labour in the construction of the nests. *Saropoda*, *Anthophora*.

NATURAL ORDER.—APITES, *Social Bees*.

Larva inhabits a cell usually hexagonal, and made of wax by the imago; it is fed with honey or a preparation of pollen by the imago. Pupa changes in a silken cocoon within the cell. Imago, with the antennæ thirteen-jointed in the female, fourteen-jointed in the male, elbowed at the second joint; labium, with its ligula trilobed, the central lobe elongate, hirsute, extending beyond the labial feelers, the lateral lobes very short and obtuse; the labial

feelers with the basal joint twice the length of the second, the third and fourth minute, short, and seated on the back of the second, rather before its extremity; blade of the maxillæ lanceolate, nearly as long as the labial feelers; maxillary feelers minute, apparently exarticulate; hind-tibizæ with brushes for collecting farina. Live in large societies, composed of three kinds of individuals, males, females, and abortive females; the latter perform the laborious offices of the commonwealth. *Apis*, the honey-bee; *Bombus*, the humble-bee.

NATURAL ORDER.—APATHITES, *Cuckoo-bees*.

Larva hatched from an egg, deposited by its parent in the nests of all the preceding *Apina* at the time when their own eggs are laid; when it hatches, being stronger and larger than the rightful possessor of the cell, it consumes the food provided for its companion, and starves it to death; and in those instances in which fresh supplies of food are daily provided, it continues to receive and appropriate them as its own. Pupa changes in the same situation, in a silken cocoon, spun by the larva. Imago has no apparatus either on the body or legs for collecting honey; in other respects it resembles in structure each of the orders of *Apina* before described; it enters their nest with perfect familiarity, and seems to be quite unsuspected of intrusion; it collects no pollen or honey, never builds a nest of any kind or takes any care of its young, but spends its time among flowers, or hovering about sand-banks in which other bees have fixed their habitations. *Apathus*,^k *Cœliorxys*, *Melecta*, *Stelis*? *Epeolus*, *Nomada*, *Hylæus*?

NATURAL ORDER.—CHRYSIDITES.

Larva and pupa, as in the *Apathites*, prey on the food destined for other insects, particularly of the two preceding Stirpes. Imago, with the antennæ thirteen-jointed in both sexes, the second joint elongated, and forming a slight elbow; maxillæ obtuse, dilated, their palpi five-jointed; labium, with the ligula obtuse, entire; labial palpi three-jointed; ocelli three; body convex above, flattened or sometimes concave beneath, furnished, in the females, with a tubular retractile oviduct, but without a sting; colours excessively brilliant, red, green, and blue, with a metallic

^k *Apathus*. The genus *Psithyrus* of Dalbom. It closely resembles *Bombus*, except in the want of the hirsuties on the hind legs for collecting pollen. In both of our lists of British insects the species of this genus are scattered throughout the genus *Bombus*: the same is the case in Kirby's "*Monographia Apum Angliæ*." *Psithyrus* is a genus of *Sphingites*.—A, *absque*, *παθος*, *affectio*.

gloss; abundant in fine sunshiny weather, settling on walls, sand-banks, posts, railings, &c. running with activity, and a vibrating motion of the antennæ. (*Parnopes*, *Stilbum*, *Euchræus*,) *Hedychrum*, *Elampus*, *Chrysis*, *Cleptes*.

STIRPS.—ICHNEUMONINA, *Parasites*.

NATURAL ORDER.—PROCTOTRUPITES.

Larva inhabits and feeds on the larvæ of other insects. Pupa changes in the same situations. Imago, with antennæ composed of ten to fifteen joints, elongate in the males, shorter and often clavated in the females; mandibles somewhat elongate, their extremity generally bifid; maxillæ with the blade dilated, rounded, feelers generally three-jointed; labium, with its ligula seldom produced, entire, feelers minute, often exarticulate; ocelli three; fore-wings with a single principal nervure; hind-wings without nervures; oviduct of the female tubular and retractile, being simply an elongation of the body. Inhabits grass under trees, &c. during the greater part of the year. *Cinetus*, *Psilus*, *Proctotrupes*, *Platygaster*, *Teleas*, *Ceraphron*, *Sparasion*, *Dryinus*, *Helorus*?

NATURAL ORDER.—MYMARITES.

Larva inhabits and feeds on the eggs of Lepidopterous insects. Pupa changes within the shell of the egg. Imago, with the antennæ nine- to thirteen-jointed, sometimes twice the length of the body in the male, in the female elbowed and clavated; mandibles at the apex tridentate; the other organs of the mouth are obsolete or undiscovered; fore-wings pedunculated, with one short basal nervure, strongly ciliated; hind-wings the same, often a mere seta; legs long; pœdon elongate, slender; ovipositor very slender, concealed beneath the body in a groove. Inhabits grass under trees. *Ooctonus*, *Litus*, *Anagrus*, *Polynema*, *Mymar*, *Eustochus*.

NATURAL ORDER.—CHALCITES.

Larva inhabits and devours other insects in all stages, particularly the larvæ of *Lepidoptera* and *Diptera*. Pupa usually changes within the skin of its victim. Imago, with the antennæ generally composed of thirteen joints, the second long, forming an elbow, the remaining joints generally incrassated towards the apex; mandibles obtuse; maxillæ, with the blade rather produced, but obtuse; maxillary palpi four-jointed; labium, with its

ligula always produced, but short and entire; labial palpi three-jointed; ocelli three; head very large, square; fore-wings with a single nervure, often ciliated; hind with none; body often short and depressed in the males, more elongate and pointed in the females; oviduct of the female slender, mostly concealed; colour mostly brilliant. *Perilampus*, *Leucospis*, *Smiera*, *Chalcis*, *Callimome*, *Pteromalus*, *Encyrtus*, *Eulophus*, *Spalangia*, *Eucharis*.

NATURAL ORDER.—CYNIPITES.

Larva inhabits and causes the excrescences we observe on the trunks, twigs, leaves, &c. of trees, particularly the oak, and commonly known as "galls," feeding on the sap or substance. Pupa changes in the cavity made by the larva. Imago, with the antennæ composed of thirteen to fifteen joints, increasing in size exteriorly, but never clavated; mandibles obtuse; maxillæ dilated, obtuse, feelers often five-jointed; labium short, with its ligula produced, generally as long as the feelers, entire; feelers mostly three-jointed; wings with many nervures; head rather small, somewhat retiring; mesothorax large and convex; podeon short, very slender; body compressed; decatory in the female very large; ovipositor curved, or spirally convoluted beneath the body. Beaten out of trees, and off grass, in the summer. *Cynips*, *Figites*, *Ibalia*, *Anacharis*.

NATURAL ORDER.—EVANIITES.

Larva inhabits the larvæ of *Sphecina*, and occasionally of *Blattina*. Pupa changes within the cocoon spun by the larva of the former of these Stirpes. Imago, with antennæ thirteen-jointed, of uniform thickness, and very straight; mandibles short, stout, acute, and bifid; maxillæ dilated and obtuse, feelers six-jointed; labium, with the ligula very short, quadrilobed, the lateral lobes very minute, feelers long, often robust, four-jointed; wings with many nervures; podeon slender. Found in summer, flying over flowers and about sand-banks, in which the *Sphecina* have formed their burrows and provided for their young. *Evania*, *Brachygaster*, *Fænus*, (*Pelecinus*? *Stephenus*?) *Plancus*.

NATURAL ORDER.—BRACONITES.

Larva more obese, without distinct markings and divisions; feeds, often in company, on the larvæ of *Lepidoptera*, and other insects, while they are still living. Pupa changes within the skin of the Lepidopterous larva, or in small silken cocoons, attached to the

hair or body of its prey, or to the trees and leaves in the neighbourhood, from which it is occasionally seen suspended by a silken thread; more than thirty of these parasites sometimes feed within the body of a single caterpillar of the cabbage butterfly, which may be seen in numbers glued to palings, in the autumn, by these parasites, and surrounded by their little yellow cocoons, giving to the uninstructed the idea of a caterpillar sitting on its eggs. Imago, with the antennæ ten- to twenty-jointed; mandibles short, generally bifid; maxillæ obtuse, feelers six-jointed, elongate; labium short; ligula obtuse and entire; feelers four-jointed; ocelli three; fore-wings with fewer nervures than the following Order; hind-wings with still less; pòdeon slender and short; oviduct with two protecting appendages. Inhabits grass, shrubs, &c. throughout the summer; often flies in a vaulting company, like gnats in the sunshine; runs slowly. *Bassus*, *Rogas*, *Alysia*, *Bracon*, *Microgaster*, *Microdus*, *Sigalphus*, *Aphidius*.

NATURAL ORDER.—ICHNEUMONITES.

Larva elongate, with the divisions of the segments clearly defined; an indentation frequently passes along the sides, above and below the middle portion, which thus becomes raised: solitary; inhabits and devours the fleshy parts of other insects, while they are themselves yet alive and performing their usual functions; during the whole of its parasitic career taking care to do no injury to those parts on which the life of its prey depends. Pupa changes sometimes within the shell of the pupa of the Lepidopterous insects; sometimes in the ground, in a tough, close, leathery cocoon, spun by the larva. Imago, with long filiform antennæ composed of about forty joints; mandibles short, stout, acute, and bifid; maxillæ dilated and obtuse, their feelers six-jointed, and often very long; labium short, its ligula short and bilobed, its feelers generally four-jointed; ocelli three; fore- and hind-wings with numerous nervures; pòdeon always slender, seldom or never elongate; oviduct generally defended by a setaceous appendage on each side, thus appearing to be triple: varies greatly in length. Inhabits vegetables of all kinds throughout the summer, the females busily engaged in searching after Lepidopterous larvæ in which to deposit their eggs; their wings and antennæ are continually in motion; the males frequent umbellate flowers, and feed on pollen; the females not unfrequently eat small insects and larvæ. *Ichneumon*, *Anomalon*, *Ophion*, *Banchus*, *Pellastes*, *Alomya*, *Cryptus*, *Pimpla*, *Xylonomus*.

STIRPS.—SIRECINA.

NATURAL ORDER.—SIRECITES.

Larva hatched from eggs deposited in the wood of the fir-tree, sometimes two or three hundred in a cluster, cylindrical, with six rudimental articulate legs; head corneous; paratelum incrassated; gnaws the timber, making a bore, in which it lives, the exact size of its body. Pupa changes in the same situation. Imago, with antennæ filiform, attenuated exteriorly, composed of fifteen to thirty joints, the number varying in different individuals of the same sex and species; mandibles strong, trifid; maxillæ rather elongate, soft, flexible, obtuse, their feelers very minute, exarticulate; labium somewhat triangular; ligula short, entire, dilated; feelers three-jointed, the terminal joint long and incrassated; ocelli three; wings ample, with many strong nervures; prothorax fully developed, broader than the head, its anterior and posterior margins concave; the following segments fully and equally developed; ovipositor exerted, composed of three setæ. Inhabits fir-plantations. *Sirex*, (*Tremex*.)

NATURAL ORDER.—XYPHIDRIITES.

Larva perfectly without feet. Inhabits and lives on the dead or dying wood of various trees. Pupa changes in the same situations. Imago, with antennæ composed of seventeen or eighteen joints, gradually attenuated towards the apex; mandibles small, with four distinct teeth; maxillæ short, obtuse, their feelers biarticulate; labium short; ligula, minute, entire; feelers four-jointed; ocelli three; head orbicular, large; prothorax very long, slender, and neck-like; the remaining segments of uniform size; the oviduct of the female exerted, covered above by a sheath-like appendage. Inhabits posts, decayed willows, &c. flying in the sunshine. *Xyphidria*.

NATURAL ORDER.—XYELITES.

Larva perfectly without feet. Feeds in the wood of fir-trees, making channels, as in the two preceding Orders. Pupa changes in the same situations. Imago, with antennæ twelve-jointed, the basal and second joint short, the third very long, and the nine following very short, together scarcely equalling the third in length, elbowed twice, at each end of the long joint; mandibles moderately long, acute, and dentate internally; maxillæ with the blade small, obtuse, the galea biarticulate, the feelers very long and four-jointed; labium short, ligula hitherto undiscovered,

feelers four-jointed; ocelli three; wings very ample; legs short; prothorax not developed superiorly, the mesothorax and head meeting above it; podeon as wide as the other segments; oviduct ensiform, exserted, enclosed between two appendages. Inhabits fir-trees, occasionally settling on umbelliferous plants. *Xyela*.

NATURAL ORDER.—ORYSSITES.

Larva and pupa unknown; the former is supposed to feed on the wood of dead fir-trees and old horn-beams. Imago, with antennæ eleven-jointed in the male, ten-jointed in the female, short, rather incrassated exteriorly, the joints of various proportions and forms; mandibles dilated, rounded, pubescent; maxillæ, with the blade, obtuse, rounded; the galea rather elongate, narrow, and truncate at the apex; feelers long, pubescent, and five-jointed; labium short, with the ligula small, rounded, and entire, and the feelers rather short and three-jointed; ocelli three; fore and hind wings moderately large, with numerous nervures; legs short; prothorax with very little development superiorly; podeon as wide as the other segments; ovipositor spirally convoluted beneath the body. Inhabits fir and horn-beam trees, running over them in the sunshine with great rapidity; the male has been found on umbellate flowers. *Oryssus*.

STIRPS.—TENTHREDININA, *Saw-flies*.

NATURAL ORDER.—ALLANTITES.

Larva cylindrical, of uniform substance, with six articulated and twelve or fourteen membranaceous feet. Inhabits vegetables, feeding upon their leaves in the manner of *Lepidopterous* larvæ. Pupa sometimes changes in a cocoon, fixed in a curled leaf of the plant the larva feeds on, but most commonly on or in the ground. Imago, with antennæ nine-jointed, of uniform substance, or attenuated towards the apex; mandibles short, strong, very acute at the apex, and having one internal tooth; maxillæ, with the blade acute, the galea obtuse and exarticulate, the feelers long and six-jointed; labium short, with the ligula distinctly trilobed; wings ample, the disposition of their nervures afford characters for generic division; podeon equally developed with the other segments; oviduct with teeth like a saw. The species of this order are most abundant in the spring and summer in woods, gardens, and lanes, settling on leaves and flowers, flying with ease, but not far at a time, and being full of motion and activity in the sunshine. They feed apparently on the pollen of flowers.

Nematus, Cladius, Cræsus, Emphytus, Dolerus, Dosytheus, Allantus, Fenusa, Selandria, Athalia.

NATURAL ORDER.—HYLOTOMITES.

Larva cylindrical, rather attenuated towards the extremities, with six articulated and fourteen membranaceous legs. Inhabits and feeds on the leaves of vegetables; changes its colour with every change of skin, a peculiarity to which some of the *Allantites* are also subject. Pupa changes mostly on the surface of the ground. Imago, with the antennæ three-jointed; the basal and second joints very short, the third very long, ciliated, and often double, or having two shafts in the manner of a fork; mandibles corneous, acute, with a small internal tooth; maxillæ with the blade acute, the galea robust and obtuse, the feeler long and six-jointed; labium short, with the ligula small, but distinctly trilobed; feelers four-jointed; ocelli three; body, with the segments and oviduct, as in the *Allantites*. Settles and feeds on umbellate flowers. *Schizocerus, Hylotoma.*

NATURAL ORDER.—TENTHREDINITES.

Larva mostly chagreened, cylindrical, with six articulate and twelve prehensile legs. Feeds on the leaves of trees. Pupa changes in a case composed of a glutinous matter, which becomes very hard when exposed to the air; the case is attached to a slender twig of the plant on which the larva feeds; in this case the larva remains unchanged during the months of autumn, winter, and spring. Imago, with antennæ seven-jointed, of which the third joint is always elongate, and the apical ones always form a club; the mandibles are longer than in the preceding order, acute at the apex, and internally bidentate; maxillæ, with the lacinia, obtuse and hirsute, the galea rather obtuse and distinctly articulate, and the feelers long and six-jointed; labium short, with the ligula distinctly trilobed, the feelers four-jointed; ocelli three; segments of the body fully developed; oviduct as in the *Allantites*. Inhabits flowers and leaves; flies in the sunshine. *Abia, Zaræa, Cimbeæ, Trichissoma, Clavellaria.*

NATURAL ORDER.—LYDITES.

Larva smooth, cylindrical, with six short, articulate, and no prehensile legs. Feeds on the leaves of trees, inhabiting a web of its own making. Pupa changes in a silken cocoon on the stem of the trees it inhabits, or on the ground. Imago, with the antennæ composed of seventeen to thirty segments, filiform, and attenuated

exteriorly; mandibles long, acute at the apex, and having one tooth internally; maxillæ, with the blade and galea, obtuse, the feeler long and six-jointed; labium short, ligula more produced, trilobed; ocelli three; head large, orbicular; wings ample, with numerous nervures; legs short; podeon fully developed; body short and robust. Inhabits woods, flying in the sun, settling on leaves, and occasionally, but rarely, on flowers. *Tarpa*, *Lyda*, *Lophyrus*? which principally differs in its pectinated antennæ.

NATURAL ORDER.—CEPHITES.

Larva elongate, with its feet obsolete or rudimental. Inhabits and feeds on the stalks of corn and the buds of fruit-trees. Pupa changes within the stalk. Imago, with antennæ twenty-jointed, long, filiform, slightly incrassated externally; mandibles short, broad, trifid; maxillæ with the blade distinct and acute, the galea elongate, and separated from the maxilla by a distinct line, resembling an anchylosed articulation, the feeler long and six-jointed; labium, with its four parts, perfectly developed, the feeler-bearer elongate, and notched at the apex, the ligula produced and trilobed, and the feeler four-jointed; ocelli three; head rather square, broader than the following segments; prothorax fully developed, cylindrical, quite detached from the mesothorax; podeon fully developed, divided on the back longitudinally; body elongate; legs elongate; flight easy and graceful in the sunshine. Settles in abundance on composite flowers by the road-side, and in meadows on *Ranunculi*. *Cephus*.

CLASS IV.—COLEOPTERA.

Larva, with corneous mandibles moving horizontally; a pair of articulate feet, generally on the second, third, and fourth segment; no other feet, unless a prehensile caudal appendage occasionally present can be so denominated. Food very various. Pupa of nearly uniform appearance. Imago, with the parts of the mouth fully developed; the mandibles moving horizontally, and being employed in mastication. Wings fully developed; fore-wings hard, crustaceous, not used in flying, when closed meeting with parallel edges, and completely covering the hind-wings, to protect which appears their only office; hind-wings generally much longer than the body, folded longitudinally and transversely beneath the fore-wings. Prothorax very large; mesothorax small; metathorax large. Food various.

STIRPS.—BLAPSINA.

NATURAL ORDER.—BLAPSITES, *Slow-legged-beetles*.

Larva elongate, cylindrical, with six articulate and one caudal leg. Lives in the dark, feeding on decayed animal and vegetable substances. Pupa changes in the same situations. Imago, with moniliform antennæ, the third joint being the longest; mandibles small but strong, bifid at the apex; maxillæ with a single tooth internally; wings, particularly the hind pair, frequently wanting. Inhabits cellars, out-houses, decayed trees, shunning the light, and moving by night with a slow, awkward, and disgusting gait; of uniform dark brown or black colour. (*Pimelia*), *Blaps*, *Tenebrio*.

NATURAL ORDER.—HELOPITES.

Larva very elongate, cylindrical, frequently with two hooks on the telum. Inhabits and feeds on decayed wood. Pupa changes in the same situations. Imago, with filiform antennæ; mandibles sometimes bifid, sometimes terminating in a single point; maxillæ without the internal tooth; fore-wings generally soft and flexible, hind-wings generally perfect, adapted for flight. Inhabits decayed woods, flowers, &c. *Helops*, *Cistela*, *Melandrya*, *Conopalpus*, *Hypulus*, *Nothus*, *Ædemera*?

NATURAL ORDER.—MORDELLITES.

Larva less elongate, soft, and more fleshy; legs less distinct. Inhabit and feed on decaying wood, flowers, and sometimes parasitical in the nests of wasps. Pupa changes in the same situations. Imago, with pectinated antennæ, particularly the males; head somewhat heart-shaped, and united vertically to the prothorax; fore-wings flexible, wide at the base, narrow at the apex; hind-wings mostly without the longitudinal fold. Inhabit flowers; diurnal, fly and run with rapidity and ease. *Mordella*, *Anaspis*, *Ripiphorus*.

NATURAL ORDER.—PYROCHROITES, *Soldier-beetles*.

Larva more depressed; head as wide as the prothorax; paratelum the largest segment; telum corneous, and produced into two spines. Inhabits and feeds on decaying wood. Pupa changes in the same situations or in the ground. Imago, with long pectinated antennæ; head exserted, triangular, and porrected, horizontally narrower than the prothorax; fore-wings soft, flexible, brilliant red; diurnal, flying readily in the sunshine. *Pyrochroa*.

NATURAL ORDER.—CANTHARITES, *Blister-beetles*, &c.

Larva and pupa unknown, supposed in some instances to be parasitical. Imago, with moniliform antennæ incrassated about the middle; head larger than the prothorax, to which it is attached vertically; fore-wings short, their margins crossing each other, flexible; hind-wings often wanting; tarsi with the terminal claws double. *Meloë*, *Cantharis*.

NATURAL ORDER.—ANTHICITES, *Flower-beetles*.

Larva and pupa in decayed wood. Imago, with filiform antennæ sometimes slightly serrated; elongate linear body; soft fore-wings. Inhabits flowers, flying readily and in the day-time. *Notoxus*, *Anthicus*, *Xylophilus*.

STIRPS.—BUPRESTINA.

NATURAL ORDER.—PTINITES, *Wood-boring-beetles*.

Larva, with the articulate feet distinct, incrassated in the middle, narrower towards the tail, often covered with bristles. Commonly inhabits dry wood, through which it bores in all directions, reducing it to a powder. Pupa changes in the galleries made by the larva. Imago, with long antennæ generally filiform, but in some of the males highly pectinated; the mandibles strong and toothed; the head retractile within the prothorax; the prothorax more or less spherical; the fore-wings completely covering the body, and having often an inflated appearance. Inhabits the habitations of the larva, and occasionally flowers. *Ptilinus*, *Ptinus*, *Anobium*, *Mezium*, *Gibbium*.

NATURAL ORDER.—CLERITES.

Larva in structure like the preceding order, but more elongate, and less commonly hairy. Feeds on the larvæ of the preceding order, and occasionally of some *Hymenoptera*. Imago, with the antennæ incrassated externally; the mandibles bifid; the maxillæ obtuse; the prothorax is long, slender, cylindrical, of less circumference than the head or body. *Necrobia*, *Clerus*, *Opilus*, *Thanasimus*, *Tillus*.

NATURAL ORDER.—MELYRITES.

Larva and pupa unknown. Imago, with the antennæ filiform, tapering to the extremity; mandibles elongate, toothed, bifid at the apex; head nearly corresponding in width with the prothorax, but rather less; prothorax with the margins often dilated; when

touched, a red fleshy substance is protruded from several parts of the body and again withdrawn. Inhabits flowers; flies readily and in the sunshine. *Dasytes?* *Malachius*.

NATURAL ORDER.—LAMPYRITES, *Glow-worms*.

Larva composed of thirteen very distinct segments, the divisions between which are deeply marked, giving the back a serrated appearance; legs very perfect, the caudal leg also present. Inhabits old hedges among decayed sticks, found also under stones; feeds on minute snails, &c. Pupa changes under ground. Imago, with the antennæ filiform, moniliform, or pectinated; the mandibles small, soft, and somewhat imperfect; the prothorax flattened, dilated at the margins; the fore-wings flexible, leathery; females sometimes without wings; frequently emitting from the two last segments a bright phosphoric light. *Lampyris*, *Drilus*, *Telephorus*, *Lycus*.

NATURAL ORDER.—CEBRIONITES.

Larva and pupa unknown. Imago, with the antennæ very simple, (in the British genera) filiform; mandibles imperfect, terminating in a single point; prothorax semicircular, the convex, being the anterior margin, completely concealing the head; fore-wings and whole body soft and flexible, as though immature; more round and compact in shape than the preceding orders. Inhabits the leaves and flowers of plants in summer. *Dascillus*, *Elodes*, *Scirtes*.

NATURAL ORDER.—ELATERITES, *Click-beetles*.

Larva elongate, cylindrical, with six articulate and one caudal leg; slothful. Feeds on the roots of wheat, potatoes, &c., also occasionally in decaying timber; is very destructive to crops, and known to farmers as the WIRE-WORM. Pupa mostly changes in the ground. Imago, with moniliform antennæ, not unfrequently serrated or pectinated in the males; mandibles bifid at the extremity; head received into the prothorax; prothorax with a projecting spine beneath; metathorax with a cavity for the reception of the spine; by means of this instrument the insect, if laid on its back, leaps to a considerable height, with a loud clicking noise; diurnal, flies readily. Inhabits flowers, &c. *Elater*, *Campylus*.

NATURAL ORDER.—BUPRESTITES, *Burn-cows*.

Larva very elongate, cylindrical, with six articulate and one caudal prehensile leg. Feeds on timber. Pupa changes in the same situation. Imago, with serrated or pectinated antennæ; mandibles

short, strong, and bifid ; head more than two-thirds received into the prothorax ; prothorax beneath produced posteriorly into a spine ; but there being no corresponding cavity in the mesothorax, the insect has not, when placed on its back, the power of leaping possessed by the *Elaterites*. These insects are diurnal ; they possess the most gorgeous metallic colours ; they run and fly with ease and rapidity. *Buprestis*.

STIRPS.—SCARABÆINA.

NATURAL ORDER.—CETONIITES, *Day-chafers*.

Larva, with six elongate, weak, articulate legs, and the posterior extremity of the body incrassated, soft, and recurved under the fore-part, which, touched, rolls in a ring, with the tail on one side of the head. Inhabits and feeds on decaying wood. Pupa changes in the same situations, or in the ground. Imago, with antennæ composed of ten joints, of which the three or four terminal ones are produced laterally, and form a club ; labium membranaceous, most concealed by the clypeus ; mandibles and maxillæ pubescent and membranaceous ; colours various and brilliant ; form generally flattened above ; diurnal, flies with ease and rapidity. Feeds on the farina or honey of flowers. *Cetonia*, *Trichius*.

NATURAL ORDER.—MELOLONTHITES, *Cock-chafers*.

Larva resembles that of the preceding order. Inhabits the earth, feeding on the roots of vegetables. Pupa changes in the ground. Imago, with antennæ composed of nine or ten joints, the six or seven terminal ones produced laterally, and forming a flabellated club ; labium more corneous than in the preceding order, and not entirely concealed by the clypeus ; mandibles corneous and masticatory ; colour less brilliant ; form generally convex above ; flight easy, not rapid ; mostly nocturnal. Feeds on the leaves of vegetables. *Hoplia*, *Anomala*, *Melolontha*, *Amphimalla*, *Omaloplia*, *Phyllopertha*, *Serica*.

NATURAL ORDER.—TROGITES, *Sand-chafers*.

Larva resembles that of the two preceding orders. Feeds on decaying animal and vegetable matter found in sand, which it inhabits. Pupa changes in the sand. Imago, with antennæ composed of nine or ten joints, the three or four terminal ones forming a small round club ; labium and mandibles concealed and membranaceous ; colour black ; form oval and very convex above. Inhabit sand, particularly by the sea-shore ; seldom fly. *Trox*, *Ægialia*, *Psammodius*.

NATURAL ORDER.—SCARABÆITES, *Dung-chafers*.

Larva resembles the preceding. Inhabits and feeds on the excrement of animals. Pupa changes in the ground. Imago, with antennæ composed of nine or ten joints, the terminal one forming a compressed club; labium generally concealed by the clypeus; mandibles sometimes corneous, sometimes membranaceous; colour brown, black, or metallic-tinted black; form oval, convex above. Inhabit and feed as in the larva state; flight easy, rapid, mostly nocturnal. *Aphodius*, *Geotrupes*, *Bolboceras*, *Onthophagus*, *Copris*.

NATURAL ORDER.—LUCANITES, *Stag-beetles*.

Larva resembles the preceding; feeding on decayed wood. Pupa changes in the same situations. Imago, with ten-jointed antennæ, the basal joint very long, and the others bending forward from it at a right angle, forming an elbow, the three apical joints forming a club; labrum concealed or obsolete; mandibles very long, strong, and toothed; maxillæ weak and pilose. Flight nocturnal. Feed on the sap of plants. *Sinodendron*, *Lucanus*, *Platycerus*.

NATURAL ORDER.—HISTERITES, *Mimick-beetles*.

Larva rather more elongate than that of the *Lucanites*, in other respects nearly similar in formation. Inhabits and feeds on putrid substances. Pupa mostly changes in the ground. Imago, with clavate antennæ; strong corneous and projecting mandibles; head retractile within the prothorax; fore-wings square and very short; legs contractile; form a long square; covering excessively hard, highly polished. Inhabits putrid substances; mimics death when disturbed; flies occasionally in the sunshine. *Hister*, *Dendrophilus*, *Onthophilus*, *Abraeus*.

NATURAL ORDER.—BYRRHITES, *Pill-beetles*.

Larva as in the *Histerites*, but somewhat pilose. Feeds on the roots of vegetables and decaying wood. Pupa mostly changes in the earth. Imago, with moniliform antennæ incrassated towards the extremity, but not clubbed; mandibles corneous but not projecting; form nearly globular; covering downy, not polished; head and legs contractile. Inhabits vegetables, mimicking death if touched; crawls in the day; flies but seldom. *Nosodendron*, *Byrrhus*, *Aspidiphorus*, *Simplocaria*.

STIRPS.—SILPHINA.

NATURAL ORDER.—DERMESTITES.

Larva somewhat shuttle-shaped, very pilose. Inhabits and feeds on decayed and dried animal substances. Pupa changes in the

same substances. Imago, with short clavated antennæ; mandibles short, strong, and toothed; form oval; head and legs retractile, but less perfectly so than in the two preceding Orders. Inhabits dead animals; when shaken out or disturbed mimicking death: flight principally nocturnal. *Attagenus*, *Dermestes*, *Megatoma*.

NATURAL ORDER.—IPSITES.

Larva more elongate, slightly pubescent. Inhabits and feeds on the bark of trees or fungi. Pupa changes in the bark. Imago, with clavated antennæ, the club not abrupt, but generally formed by a gradual incrassation of the antennæ externally; prothorax nearly square, generally longer than wide; form elongate: flight only occasional, mostly diurnal. *Lycus*, *Sylvanus*, *Rhizophagus*, *Nemosoma*, *Ips*, *Tetratoma*, *Triplax*, *Mycetophagus*, *Antherophagus*.

NATURAL ORDER.—NITIDULITES.

Larva pubescent, more active than the preceding. Generally inhabits and feeds on decayed animal substances. Pupa changes in the same situations or in the earth. Imago, with clavated antennæ, the club abrupt and well defined, usually composed of three joints: active; fly readily. Inhabits, in great quantities, decayed animal substances, particularly bones, and also strongly-scented flowers. *Catheretes*, *Meligethes*, *Strongylus*, *Nitidula*, *Thymalus*.

NATURAL ORDER.—SILPHITES, *Carrion-beetles*.

Larva glabrous, depressed, attenuated posteriorly; very active. Inhabits putrefying animal substances. Pupa changes mostly in the earth. Imago, with antennæ clavated, or moniliform, externally incrassated; mandibles strong, pointed, and prominent; head capable of being bent vertically, and concealed by the prothorax, but not withdrawn into it; prothorax as wide as the body. Inhabits putrid animal substances, as dead birds, mice, rats, &c. which it buries in the earth as receptacles for its eggs; flight diurnal and nocturnal; scent very offensive. *Silpha*, *Necrophorus*, *Choleva*, *Catops*, *Ptomaphagus*, *Scaphidium*, *Scaphiosoma*.

NATURAL ORDER.—SPHERIDIITES, *Globe-beetles*.

Larva inhabits and feeds on the dung of horses and cows. Pupa changes in the same situations. Imago, with antennæ clavated; club distinct and abrupt; form nearly spherical or oval. Inhabits

and feeds as in the larva state; runs and flies with rapidity in the sunshine. *Sphæridium*, *Cercyon*. *Anisotomidæ*?

NATURAL ORDER.—HYDROPHILITES, *Herbivorous Water-beetles*.

Larva elongate, attenuated posteriorly, active, carnivorous, aquatic; head large, with long curved mandibles. Pupa changes in the earth or under dung. Imago, with clavated antennæ; mandibles strong and obtusely toothed; maxillary feelers very strong, and used in the water as antennæ; the form oval, the sides and back very convex, the surface glabrous. Inhabits water, swimming with ease, the feet being moved alternately; female covers her eggs with silk, forming a kind of cocoon, which she carries about with her in the manner of some spiders. Feeds on the decaying leaves of water-plants. *Spercheus*, *Hydrophilus*, *Hydrous*, *Hydrobius*, *Berosus*.

NATURAL ORDER.—HELOPHORITES, *Diving-bell-beetles*.

Larva less elongate; sluggish; margins of the segments fringed with hair. Inhabits duckweed, and other plants on the surface and banks of ponds, also the surface of stones, mud, &c. Pupa changes sometimes in the same situations, but mostly in the earth. Imago, with antennæ more or less clavated, short, and generally concealed; the maxillary feelers being employed as antennæ; form elongate. Inhabits the banks of ponds and rivers, among aquatic plants, on which it feeds; enclosed in a bubble of air, it crawls on water-plants and on the surface of water, with the back downwards, but does not swim. *Hydræna*, *Helophorus*, *Hydrotus*, *Georyssus*, *Elmis*, *Parnus*, *Heterocerus*.

STIRPS V.—CARABINA.

NATURAL ORDER.—GYRINITES, *Water-fleas*.

Larva, with strong arcuate mandibles; a long fleshy process, fringed with hair, rising from both sides of each segment; carnivorous, aquatic, natatory. Pupa changes at the edge of ponds. Imago, with short clavated antennæ; mandibles short and obtuse, but strong; maxillæ somewhat obtuse; galea palpiform, exarticulate; fore-legs long, middle and hind-legs short and incrassated; carnivorous. Inhabits water, performing in the sunshine its beautiful and social gyrations on the surface. *Gyrinus*.

NATURAL ORDER.—DYTISCITES, *Carnivorous Water-beetles*.

Larva, with strong arcuate mandibles, perforated at the extremity for suction; carnivorous, aquatic, natatory. Pupa changes in the

earth, at the margins of ponds, among roots of trees and grass. Imago, with filiform antennæ; mandibles short and strong; maxillæ arcuate and very acute; galea palpiform and articulate; the fore-tarsi patellated in the males; the middle and hind-legs flattened and ciliated; form oval. Inhabits water, feeding on aquatic animals; swims with great ease and swiftness, moving the corresponding legs simultaneously. *Acilius*, *Dytiscus*, *Colymbetes*, *Noterus*, *Hydroporus*, *Haliphus*?

NATURAL ORDER.—CARABITES, *Ground-beetles*.

Larva with strong arcuate mandibles; active and carnivorous. Inhabits roots of grass, rubbish-heaps, decaying vegetables, moss, under stones, &c. in which situations it pursues and seizes its prey. Pupa changes in the earth. Imago, with moniliform antennæ; mandibles moderately short, very strong; maxillæ terminate in a blade, sometimes acute, but never articulated; galea articulate and palpiform. Universally distributed, running on the ground in pursuit of prey; chiefly nocturnal, and during the day found principally under stones and timber, at the roots of grass, in the sand of gravel-pits, &c.; sometimes flies, but not to avoid pursuit. *Elaphrus*, *Bembidium*, *Harpalus*, *Carabus*, *Dyschirius*, *Brachinus*, *Dromius*, *Odocantha*, *Drypta*.

NATURAL ORDER.—CICINDELITES, *Tiger-beetles*.

Larva with strong arcuate mandibles, and frequently with two remarkable recurved hooks on its back; it is carnivorous, and lies in wait for its prey in holes or dens, which it constructs in loose earth or sand, in sunny places. Pupa changes in the holes of the larva. Imago, with strong, long, arcuate, and deeply-toothed mandibles, which cross each other at about half their length; blade of the maxillæ acute and articulated; galea palpiform and articulated; legs very long and slender: diurnal, carnivorous, of light and elegant form; brilliant colours. Runs with amazing activity; flies to avoid pursuit. *Cicindela*.

NATURAL ORDER.—STAPHILINITES, *Devil's Coach-horses*.

Larva with strong mandibles; active, mostly carnivorous. Found under stones, at the roots of grass, and in rubbish-heaps, &c. Pupa changes in the same situations. Is remarkable for the compactness with which the limbs are attached, giving it the appearance of the *Amorpha adermata*. Imago, with moniliform antennæ; strong and acute mandibles; obtuse maxillæ; rounded and never palpiform galea. These beetles are distinguished at

once from all others by their square, short fore-wings, naked body, elongate form, and disgusting manner of turning up the tail like a scorpion. Inhabits and devours all putrefying substances, also living insects. *Staphylinus*.

NATURAL ORDER.—PSELAPHITES.

Larva and pupa unknown. Imago, with acute dentate mandibles; obtuse maxillæ; rounded, exarticulate, though somewhat palpi-form galea; maxillary feelers, clavated, immensely developed, often equalling the antennæ in size; antennæ with ten or eleven joints, the last joint incrassated, forming a club; fore-wings quadrate and abbreviated; hind-wings usually wanting; tarsi two-jointed. Very minute; slow in its movements. Inhabits moss and the roots of grass, feeding on the *Acari* which occur in those situations. *Pselaphus*.

NATURAL ORDER.—SCYDMÆNITES.

Larva and pupa unknown. Imago, with antennæ eleven-jointed, moniliform, incrassated exteriorly; the basal joint rather long, the apical one ovate, which, with the two preceding, is incrassated; maxillary feelers very large, the third joint stout and conical, the fourth and terminal one small, acute; fore-wings completely cover the body; the tarsi five-jointed. Inhabit moss, and under planks near cucumber frames; feed on *Acari*. (*Mastigus*), *Scydmaenus*, *Eutheia*.

STIRPS VI.—CHRYSOMELINA.

NATURAL ORDER.—ENDOMYCITES, *Fungus-beetles*.

Larva, with six distinct articulate legs; head small; middle of the body stout, gradually attenuated to the tail. Principally inhabits and feeds on the interior of fungi. Pupa changes in the same situations. Imago, with moniliform antennæ, incrassated externally; acute mandibles; tarsi three-jointed; form very convex, oval, glabrous. Inhabits fungi. (*Dasycerus*), *Lycoperdina*, *Endomychus*.

NATURAL ORDER.—COCCINELLITES, *Lady-birds*.

Larva in structure like that of the preceding Order, but rather more elongate and active. Inhabits the leaves of vegetables, feeding on the *Aphites* which suck their sap. Pupa attaches itself by the tail to a leaf, and changes in that position. Imago, with short and rather clavate antennæ; acute mandibles; tarsi three-jointed; form very convex above, nearly hemispherical. Inhabits vege-

tables, feeding on the *Aphites* which infest them. *Cacicula*, *Chilochorus*, *Coccinella*.

NATURAL ORDER.—CASSIDITES, *Tortoise-beetles*.

Larva more obese and obtuse, spiny or radiated round the margin; the tail furnished with a remarkable forked appendage, on which the excrement accumulates, forming a kind of umbrella, which protects it in some degree from observation. Inhabits and feeds on vegetables. Pupa changes in the same situations. Imago, with moniliform antennæ; mandibles and maxillæ obtuse and minute; galea palpiform, exarticulate; head completely hidden by the prothorax, which, together with the fore-wings, form a complete covering, like the carapax of a tortoise; tarsi four-jointed; form nearly hemispherical. Inhabits vegetables, on which it feeds. *Cassida*.

NATURAL ORDER.—CHRYSOMELITES.

Larva still more obese, inactive; legs short. Feeds on the leaves of vegetables. Pupa sometimes attaches itself, and changes in the same situations, and sometimes in the earth. Imago, with moniliform antennæ, inserted far from each other; mandibles rather obtuse; maxillæ obtuse; galea palpiform, exarticulate; head nearly concealed by the prothorax; tarsi four-jointed; legs not formed for leaping; form very globose, inactive; flies seldom. Inhabits vegetables, on the leaves of which it feeds. When touched frequently emits a red fluid from the mouth. *Cryptcephalus*, *Clythra*, *Chrysomela*.

NATURAL ORDER.—HALTICITES, *Flea-beetles*.

Larva and pupa nearly as in the preceding Order; the former rather less obese. Imago, with much longer and more filiform antennæ, and inserted nearer together; more acute mandibles; maxillæ obtuse; galea palpiform and articulate; hind-legs incrassated, formed for leaping; form less globose. Inhabits and feeds on vegetables; its size is little larger than that of a flea, an insect which it emulates in the activity of its leaps; it is excessively injurious to crops, sometimes causing a total failure of turnips, rape, &c. *Haltica*.

NATURAL ORDER.—GALERUCITES.

Larva and pupa nearly as in the *Chrysomelites*. Imago, with long filiform antennæ, inserted much nearer to each other than in either of the two preceding Orders; mandibles acute; maxillæ

obtuse, with a distinctly articulate palpiform galea; legs of similar structure, not formed for leaping; form more elongate. Inhabits and feeds on vegetables; flies more readily than the two preceding Orders, but does not leap. *Galeruca*, *Adimonia*, *Auchenia*, *Laperus*.

NATURAL ORDER.—CRIOCERITES.

Larva more linear and elongate. Feeds on the leaves or within the stems of vegetables. Pupa generally changes in a silken cocoon, attached to the stems or roots of the vegetables on which it feeds. Imago, with moniliform antennæ, slightly incrassated externally, about as long as in the *Galerucites*; mandibles arcuate, bifid at the apex; maxillæ obtuse; galea incrassated, but not palpiform; prothorax proportionately much smaller than in any other Order of the Stirps; somewhat cylindrical; tarsi four-jointed; colours brilliant; flight only occasional, diurnal. Inhabits vegetables. *Crioceris*, *Donacia*.

STIRPS VII.—CERAMBYCINA.

NATURAL ORDER.—LEPTURITES.

Larva is almost entirely without feet, fleshy, linear; inhabits decaying timber. Pupa changes in the same situations. Imago, with filiform antennæ, usually about the length of the body, inserted between the eyes, but not interfering with their form; the head is elongated at its junction with the prothorax, somewhat in the manner of a neck; mandibles terminated generally in an acute point; maxillæ obtuse; galea obtuse, not palpiform; form elongate, attenuated posteriorly; tarsi four-jointed, diurnal. Inhabits flowers, apparently feeding on their farina. *Leptura*, *Pachyta*.

NATURAL ORDER.—CERAMBICITES, *Capricorn-beetles*.

Larva and pupa as in the preceding Order. Imago, with filiform antennæ, often much longer than the body, inserted close to the eyes, and partly surrounded by them; the eyes, consequently, become somewhat kidney-shaped, the head is not elongated at its junction, but is partly received into the prothorax; mandibles with an acute point; maxillæ and their galea obtuse; tarsi four-jointed; form elongate, nearly linear, slightly attenuated posteriorly: flight both diurnal and nocturnal. Inhabits the stems of trees, decayed wood, and sometimes flowers. *Molorchus*, *Clytus*, *Callidium*, *Cylindera*, *Obrium*, *Saperda*, *Lamia*, *Cerambyx*, *Prionus*.

NATURAL ORDER.—CUCUJITES, *Flat-bodied-beetles*.

Larva with six very short articulate legs; found in decayed timber. Pupa changes in the same situation. Imago, with filiform antennæ generally not longer than the prothorax; mandibles acute, porrected, and elongate, especially in the males; the maxillæ obtuse; galea pilose; head somewhat triangular, elongated posteriorly into a kind of neck; prothorax nearly square, very flat; body very flat; tarsi four-jointed. Inhabits timber. *Cucujus*, *Trogossita*? (*Parandra*, *Passandra*.)

NATURAL ORDER.—BOSTRICITES.

Larva a white maggot, completely without legs; inhabits and feeds on the bark or wood of trees, causing their death with unerring certainty. Pupa changes in the same situations. Imago, with clavated antennæ; mandibles generally bidentate; maxillæ, with their galea obtuse; the prothorax very convex, and usually as large as the remainder of the body; tarsi four-jointed; form cylindrical. Inhabit circular holes, which it bores in the bark and wood of trees, either to escape, after changing, from the pupa, or to deposit their eggs. *Cis*, *Bostrichus*, *Tomicus*, *Platypus*, *Hylesinus*, *Scolytus*, *Hylurgus*.

NATURAL ORDER.—CURCULIONITES, *Weevils*.

Larva without legs, and having occasionally in their place small mamillary processes; inhabits and feeds on the flowers, fruits, seeds, leaves, stalks, bark, wood, pith, and roots, of vegetables. Pupa changes in the same situations, sometimes naked, sometimes in a hard compact case, sometimes in a silken cocoon. Imago, with antennæ generally twelve-jointed, incrassated externally, the basal joint generally very long, the others bending forwards at a right angle, forming an elbow; these antennæ are placed on a long rostrum, which proceeds from between the eyes, and has the mouth at its extremity; mandibles generally obtuse; blade and galea of the maxillæ united and indistinct; tarsi four-jointed: mostly diurnal; feed on vegetables. *Curculio*.

NATURAL ORDER.—ANTHRIBITES.

Larva as in preceding, feeding on wood. Pupa changes in the channels made by the larva. Imago, with antennæ generally twelve-jointed, the basal joint not particularly elongate, therefore not elbowed, moniliform, incrassated externally, not situated on a

distinct rostrum, much elongated in the males; mandibles and maxillæ nearly as in the preceding Order; tarsi four-jointed. Inhabits the bark and wood of trees. *Brachytarsus*, *Platyrrhinus*, *Anthrribus*. *Bruchus* differs only in the superior size of its labrum, and in feeding on pulse.

NATURAL ORDER.—SALPINGITES.

Larva and pupa as in the preceding Orders; the former feeds on the wood and bark of trees. Imago, with antennæ shorter, moniliform, somewhat incrassated externally, and situated on a rostrum; mandibles and maxillæ obtuse; fore- and middle-tarsi five-jointed; hind-tarsi four-jointed. Found in the same situations as the larva, and also among the leaves of trees. *Salpingus*, *Sphæriestes*.

DIVISION III.—TETRAPTERA ISOMORPHA.

Larva resembling the imago in structure, appearance, mode of feeding, &c. wings only being wanted. Pupa, or quiescent state, none.

CLASS IV.—ORTHOPTERA.

Imago, with the parts of the mouth fully developed; labrum quadrate and movable; mandibles strong, bony, masticatory, and moving horizontally; maxillæ with feelers, and a distinct, exarticulate, palpiform galea; fore-wings coriaceous, little used in flight; hind-wings longitudinally folded; flight weak and badly sustained.

STIRPS.—FORFICULINA.

NATURAL ORDER.—FORFICULITES, *Earwigs*.

The antennæ are many-jointed, moniliform, and decrease in size to the extremity; the fore-wings square, coriaceous, meeting with a straight suture, very short, and not used in flight; the hind-wings ear-shaped, folded, and projecting beyond the fore-wings; hind-legs not formed for leaping; tarsi three-jointed; telum furnished with two appendages which meet like forceps; nocturnal insects, feeding on vegetables. *Forficula*, *Labia*, *Labidura*.

STIRPS.—ACHETINA.

NATURAL ORDER.—ACHETITES, *Crickets*.

Antennæ very long, slender, and composed of many joints; fore-wings short, coriaceous, one partially covering the other, not

used in flight; hind-wings folded longitudinally, and projecting beyond the fore-wings; hind-legs incrassated, formed for leaping; tarsi three-jointed: nocturnal, subterranean insects, feeding on vegetables. *Gryllotalpa*, *Acheta*.

STIRPS.—GRYLLINA.

NATURAL ORDER.—GRYLLITES, *Grasshoppers*.

Antennæ very long, slender, and composed of many joints; fore-wings coriaceous, as long as the hind-wings, which are folded longitudinally beneath them; hind-legs incrassated, formed for leaping; tarsi four-jointed; female furnished with an exserted oviduct: diurnal; feed on vegetables. *Gryllus*.

STIRPS.—LOCUSTINA.

NATURAL ORDER.—LOCUSTITES, *Locusts*.

Antennæ short, incrassated towards the middle or extremity, consisting of about ten joints; fore-wings coriaceous, generally as long as the hind-wings, which are folded longitudinally beneath them; hind-legs incrassated, formed for leaping; tarsi five-jointed; diurnal: feed on vegetables. *Locusta*, *Gomphocerus*, *Acrydium*.

(STIRPS.—SPECTRINA.

NATURAL ORDER.—SPECTRITES, *Spectres*.

Antennæ short, stout, composed of few joints; fore-wings coriaceous, small, short, often wanting, never covering the hind-wings, not used in flying; hind-wings folded longitudinally, often very large and beautifully coloured, sometimes wanting; legs alike in structure, not formed for leaping; tarsi five-jointed; prothorax short: diurnal; feed on leaves. *Spectrum* *Phasma*.)

(STIRPS.—MANTINA.

NATURAL ORDER.—MANTITES, *Walking-leaves*.

Antennæ long, filiform, very slender, and composed of many joints; fore-wings coriaceous, horizontal, generally covering the hind-wings, which are folded beneath them; fore-legs incrassated, and armed with teeth, longer than the middle- and hind-legs; tarsi five-jointed; prothorax long: diurnal; feed on other insects. *Mantis*.)

STIRPS.—BLATTINA.

NATURAL ORDER.—BLATTITES, *Cockroaches*.

Antennæ very long, filiform, tapering, and many-jointed; head bending beneath the prothorax; fore-wings somewhat coriaceous, horizontal, one folding over the other, covering the hind-wings, which are folded beneath them; legs alike in structure; tarsi five-jointed: nocturnal; voracious; omnivorous; run rapidly; fly badly; do not leap. *Blatta*.

Situation at present doubtful.

NATURAL ORDER.—THRIPSITES, *Ticklers*.

Antennæ conspicuous, composed of eight joints; fore- and hind-wings linear, and of equal length; tarsi two-jointed. Very minute. Inhabit flowers, feeding on the farina. When running on the skin they cause an intolerable itching. *Thrips*.

CLASS V.—HEMIPTERA.

Imago, with the parts of the mouth only partially developed; the mandibles are without any horizontal motion, but elongate and slender, and, together with the maxillæ and tongue, are inclosed in a sucker, which is composed of the labium principally, but protected about by the labrum; this sucker is bent beneath the head and breast, excepting when in use, when it is usually thrust perpendicularly into the rind of vegetables, or skin of animals, to extract the sap or blood, which, in the class, constitute the food; the feelers are obsolete; all the wings are fully developed, and in the greater portion serve occasionally as organs of flight; the flight is, however, weak, and of short duration.

STIRPS.—CIMICINA.

NATURAL ORDER.—CIMICITES, *Bugs*.

Antennæ elongate, conspicuous, four- or five-jointed; fore-wings with the basal portion coriaceous, the apical portions which cross each other membranaceous; the legs are of uniform structure, not formed for leaping; the tarsi are three-jointed: terrestrial; run fast; fly rapidly, but not far at a time; feed generally on the sap of vegetables, sometimes on other insects, and occasionally,

but apparently unnaturally, on the blood of vertebrate animals.
Cimex,¹ &c.

STIRPS.—HYDROMETRINA.

NATURAL ORDER.—HYDROMETRITES, *Water-bugs*.

Antennæ elongate, conspicuous, four- or five-jointed; fore-wings coriaceous, of uniform substance; hind-wings membranaceous; all the wings linear; legs of uniform structure, very long, not formed for leaping; tarsi three-jointed; body elongate, linear: aquatic, running with ease and rapidity on the surface of water.
Hydrometra, *Gerris*, *Velia*.

STIRPS.—NEPINA.

NATURAL ORDER.—NEPITES, *Water-scorpions*.

Antennæ very short, concealed below the head; fore-wings coriaceous, crossed at the apex; hind-wings membranaceous, completely concealed beneath them; fore-legs hooked, predatory; tarsi with a single joint; middle- and hind-legs not formed for swimming; tarsi two-jointed; tail armed with two long setaceous appendages: aquatic; carnivorous; crawl on aquatic plants, but do not swim. *Ranatra*, *Nepa*.

STIRPS.—NOTONECTINA.

NATURAL ORDER.—NOTONECTITES, *Water-boatmen*.

Antennæ very short, concealed below the head; fore- and hind-wings as in the preceding; fore-legs unarmed, middle- and hind-legs formed for swimming; all the tarsi two-jointed; tail without appendages: aquatic; carnivorous; swim with ease, swiftness, and elegance; cannot crawl on aquatic plants like the preceding.
Naucoris, *Notonecta*, *Corixa*, *Sigara*.

STIRPS.—CICADINA.

NATURAL ORDER.—CICADITES, *Frog-hoppers*.

Antennæ very short, scarcely projecting beyond the head; fore-wings coriaceous, meeting with a straight suture; hind-wings membranaceous; hind-legs incrassated, formed for leaping; tarsi three-jointed; leap readily; fly badly. Inhabit vegetables, on the sap of which they feed. *Cicada*, *Cercopis*, *Membracis*, *Psylla*, &c.

¹ The *Cimicites* require further division. See M. de Laporte's excellent classification of them.

STIRPS.—COCCINA.

NATURAL ORDER.—COCCITES, *Gall-insects*.

Antennæ hirsute, long, moniliform, many-jointed; fore-wings semi-coriaceous, of uniform substance; hind-wings wanting, or replaced by appendages similar to the halteres of *Diptera*; legs of uniform structure, not formed for leaping; tarsi two- or three-jointed in the male, with a single joint in the female; tail furnished with two long setæ. The females are apterous, and attach themselves to the bark and leaves of trees, on which they deposit their eggs, covering them with their bodies; in this situation the female resembles a gall, or casual excrescence of the plant. *Coccus*.

STIRPS.—APHINA.

NATURAL ORDER.—APHITES, *Plant-lice*.

Antennæ conspicuous, elongate, seven-jointed; fore-wings deflexed, meeting over the back with a straight suture; hind-wings much smaller and shorter; all the wings membranaceous; legs of uniform structure, not formed for leaping; tarsi two-jointed. Infest all vegetables, sucking the sap: reproduction without union of sexes for many generations. *Aphis*.

Situation at present doubtful.

NATURAL ORDER.—ALEYRODITES.

Larva oval, flat, and scale-like. Pupa changes within the skin of larva; is quiescent. Imago, with the antennæ filiform, conspicuous, and six-jointed; wings equally developed, both as to length and breadth, covered with a white, mealy substance like the scales of *Lepidoptera*; legs of uniform structure, not formed for leaping. Sits on the under-side of the leaves of the plants on which the larva feeds. *Aleyrodes*.

DIVISION III.—TETRAPTERA ANISOMORPHA.

Larva and pupa possessing no uniform mode of metamorphosis, but assuming, in different Orders, that of other Divisions.

CLASS I.—NEUROPTERA.

Larva, with strong corneous mandibles moving horizontally, and six articulate feet, situated in pairs on the second, third,

and fourth segments; prehensile feet none. Pupa various. Imago usually with the organs of the mouth, and all the wings fully developed, and resembling net-work.

STIRPS.—TERMINA.

NATURAL ORDER.—TERMITES, *White Ants*, &c.

Larva with long, filiform, multi-articulate antennæ; strong, corneous, and well-developed, and masticatory mandibles, and six elongate articulate legs: active, omnivorous, and apparently perfect, in one genus living in immense societies. Pupa isomorphous. Imago, with long, filiform, multi-articulate antennæ; strong, corneous, masticatory mandibles; wings fully developed, recumbent, reticulated; tarsi three-joints. (*Termes*), *Psocus*. The larva of a *Psocus*, which feeds on preserved insects in our cabinets, is called *Atropos pulsatorius* by some authors, and is said to make the ticking noise frequently heard in houses, and commonly known as the death-watch; in its perfect or winged-state it is not uncommon among old books, on windows, &c.

STIRPS.—PERLINA.

NATURAL ORDER.—PERLITES, *Pearl-flies*.

Larva with long, filiform, multi-articulate antennæ; strong, corneous, masticatory mandibles; telum furnished with two long, setiform appendages; active, carnivorous, aquatic. Pupa isomorphous. Imago, with long, filiform, multi-articulate antennæ; strong, corneous, masticatory mandibles; wings fully and equally developed, reticulated, recumbent; the hind-wings folded; tarsi three-jointed. Inhabits the banks of running waters, and is a very favourite food for fish; flight nocturnal. *Perla*, *Isogenus*, *Nemoura*. *Sialis* has a necromorphous pupa.

STIRPS.—RAPHIDIINA.

NATURAL ORDER.—RAPHIDIITES, *Snake-flies*.

Larva with filiform antennæ, and corneous, masticatory mandibles; active. Inhabits and feeds on decayed wood. Pupa isomorphous. Imago, with moniliform antennæ; corneous, masticatory mandibles; large porrected head; elongate prothorax; wings uniformly and fully developed, recumbent, deflexed, not folded, beautifully reticulated; tarsi four-jointed; telum with a seta: flight diurnal, in the sunshine. *Raphidia*.

NATURAL ORDER.—HEMEROBITES, *Lace-winged-flies*.

Larva, with filiform antennæ; prominent corneous mandibles and maxillæ; sacciferous, carnivorous. Inhabits the leaves of vegetables. Pupa necromorphous; changes within the sack formed by the larva. Imago, with long, moniliform antennæ; corneous, masticatory mandibles, wings fully and equally developed, not folded, beautifully reticulated, deflexed; tarsi five-jointed; smells fetid; flies mostly in the evening. *Hemerobius*, *Chrysopa*, *Osmylus*. (*Myrmoleon* and *Ascalaphus* differ only in their singular pit-fall making larvæ and their clavated antennæ).

STIRPS.—PHRYGANINA.

NATURAL ORDER.—PHRYGANITES, *Stone-flies*.

Larva with short antennæ; corneous, masticatory; mandibles; sacciferous, aquatic. Pupa necromorphous, changes in the sack formed by the larva. Imago, with very long, multi-articulate, filiform antennæ; mandibles and maxillæ obsolete; fore-wings deflexed, very hairy; hind-wings ample, much folded longitudinally, not so hairy; tarsi five-jointed. Inhabits the neighbourhood of water; flies in the evening and during the night, and is a favourite food of fish. *Phryganea*.

STIRPS.—EPHEMERINA.

NATURAL ORDER.—EPHEMERITES, *Caddew-flies*.

Larva with long, filiform antennæ; corneous, masticatory mandibles; six articulate legs, and numerous lateral fins, which aid it in swimming, and which also serve to separate air from the water, and convey it to the trachææ; aquatic, carnivorous. Pupa isomorphous. Imago, with short concealed antennæ; mandibles and maxillæ obsolete; fore-wings fully developed; hind-wings small or obsolete; all the wings beautifully reticulated, erect, and meeting above the back; tarsi four-jointed; telum furnished with long setiform appendages; retains a superfluous skin after having attained its final form, characters, and even the power of flight; this skin renders the wings opaque, when shed they are more transparent. Flight in the evening, in company, rising and falling; a favourite food of fish, and a bait much in request among anglers. *Ephemera*, *Bætis*, *Cloëon*.

STIRPS.—LIBELLULINA.

NATURAL ORDER.—LIBELLULITES, *Dragon-flies*.

Larva with short antennæ; corneous, masticatory mandibles; very elongate, jointed, and remarkable labium, furnished with preda-

tory, acute, mandibuliform palpi; aquatic, carnivorous. Pupa isomorphous. Imago, with minute antennæ nearly concealed; strong, corneous, masticatory mandibles; labium of moderate proportions; wings of uniform development, beautifully reticulated, porrected, laterally or erect, meeting above the back; tarsi three-jointed; flight rapid, well sustained; active, carnivorous. *Agrion*, *Libellula*, *Æschna*.

Situation at present doubtful.

NATURAL ORDER.—PANORPITES, *Scorpion-flies*.

Larva and pupa unknown. Imago, with long, filiform, multi-articulate antennæ; mandibles and maxillæ corneous, produced into a beak; wings of equal development, horizontally recumbent on the back; tarsi five-jointed; telum armed with an appendage resembling a lobster's claw; flight weak, of short duration, diurnal. Inhabits abundantly the woods and hedges of England throughout the summer. *Panorpa*, (*Bittacus*, *Nemoptera*).

ART. XXXVIII.—*Entomological Society*.

TENTH SITTING.—JULY 7.

THE SECRETARY read a paper, by Mr. Babington, upon the genus *Dromius*.

The SECRETARY read a paper by himself, describing a British Neuropterous Insect, and giving it a new generic name: the name escaped us.

The SECRETARY read a paper by M. Chevrolat, on a species of the family *Curculionidæ*, which he had received from St. Helena.

The SECRETARY read a paper by himself, on the Neuropterous genera *Acentropus* (Curtis), *Acentria* and *Zancle* (Stephens' Nom. 2d Edit.); the author considers these genera Lepidopterous.

The SECRETARY read the conclusion of the paper by himself and Mr. Templeton, on the genera *Lepisma* and *Podura*.

The SECRETARY read the title of a paper by himself, entitled "Notes upon Nomenclature;" but the President thinking the meeting had sat sufficiently long, it was withdrawn.

During the meeting, a long discussion took place about a species of *Aphis*, which has committed great ravages among the sugar-canes in the West Indies. A Mr. J. C. Johnson, who was present, and who had lately arrived from the West Indies, stated that full two-thirds of the crops had been destroyed by it.

ELEVENTH SITTING.—AUGUST 4.

COL. SYKES took the chair.

MR. INGPEN exhibited the nest of a wasp (probably of the genus *Odynerus*) which he had found behind a book-shelf; some paper, which had fallen in the same situation accidentally, had been curiously employed by the insect for the outer covering of its nest. The nest itself was composed of a kind of mortar made from mud; it was nearly five inches in length, and had various circular apertures through which the insects, on coming to perfection, had made their exit.

The SECRETARY read a paper by Col. Sykes, on some Indian species of ants, and gave some highly interesting particulars of their economy. The descriptions were of three separate species. The first species builds its nest in trees, fixing it with great strength and firmness; the nest itself is nearly globular, about eight inches in diameter, and built entirely of dried cow-dung. The second species (we understood the name to be *indefessus*) exhibits a remarkable instinct very little short of reason. He was accustomed to have his desert placed on a sideboard, near a wall, and left all night, the legs of the sideboard being immersed in vessels of water; notwithstanding which precaution, the sideboard was found in the morning covered with ants, and the sweets were plundered most severely. On seeking the mode in which the intrusion was effected, he found that they got one after another into the water, till a floating living bridge was stretched across it, and then the legs were readily mounted. This mode of access was effectually stopped by a rim of turpentine round each of the legs just above where they entered the water; but the evil was not cured; for, on the following morning, the ants were on the table, and the good things plundered as before; he found that the ants had crawled up the wall in great numbers, and crowded to the part level with the edge of the side-board, which was not more than an inch from the wall, and so

stretched across and obtained a footing, thus running the risk of a fall, which many of them received. The sideboard was now moved quite away from the wall, and for awhile the sweets remained untouched; but soon the usual visitants were again observed, and, for several days, it appeared impossible to account for the intrusion; when, at last, he was standing near the table, and observed a solitary ant climbing quietly up the wall of the room: when it had mounted to rather more than a foot above the level of the sideboard, it took a spring and came down among the sweets; this seemed altogether so extraordinary a proceeding, that he thought it must be the effect of chance; but very soon he saw many other ants make their appearance and mount the wall, like their forerunner, until they reached a certain elevation above the sideboard, when they one and all, without exception, leaped from the wall, *seriatim*, and alighted safely among the sweets: thus their continued appearance was accounted for. The third species was remarkable, as disproving the somewhat absurd theory, proposed by Gould, and almost universally received, that ants do not lay up stores for the winter; a theory which entomologists in particular had fully adopted and entered into. He had seen the ants of this species, in great numbers, carrying the seeds of a grass, which they carried with great care and tenacity to their nests, and laid up in their stores.

The SECRETARY read a paper by himself, being a description of *Lamia Norrisii*, one of the family *Cerambycidae*.

The Rev. F. W. HOPE combatted the opinion expressed by Col. Sykes, that the ant's nest was constructed of cow-dung; he thought it was more probably composed of that paper-like substance employed by some other gregarious insects, particularly wasps.

TWELFTH SITTING.—SEPTEMBER 1.

The SECRETARY read a paper by the Rev. F. W. Hope, on the genus *Mimela*, belonging to the *Scarabæidæ*.

The SECRETARY read a paper by himself, on the Naming of Insects; he defended, at great length, the various subjects attacked by a writer in the Entomological Magazine, and shewed that they were perfectly justifiable and in accordance with established usage: he instanced a long name, of his own giving, and pointed out its advantages, (we did not catch the

name, but it appeared of very great length and harshness); he then dwelt on the propriety of naming insects after persons who have captured them, by adding the letter *i* to the surname of the captor; he particularly instanced *Waterhouse-i*, which he thought a very excellent name, and much better than *Aquadomi*, which would be the Latin of Mr. Waterhouse's name; he, however, suggested that such names should be pronounced *Waterhous-e-i*, *Ho-pe-i*, *Davi-si-i*, the nominatives being *Waterhous-eus*, *Ho-peus*, and *Davi-sius*.

The SECRETARY read a letter from Dr. Haslar, of Philadelphia, relative to *Cicada Septendecem*, an insect which abounds in North America. Dr. Haslar states that, in the larva state, these insects live in the earth; on appearing above-ground, they are devoured with avidity by poultry, and those hens which had eaten a great number of them usually laid eggs with colourless yolks. Specimens of the insect, in the imago state, were exhibited, as well as some of the pupæ about to change.

[The attendance of members at these sittings has greatly decreased; at the July sitting, about twenty members were present; at the August sitting, about fifteen; at the September sitting, about twelve.]

ART. XXXIX.—*Varieties.*

36. *Capture of Lepidoptera at Great Yarmouth.*—
 SIR, Should you have any room, it may be interesting to record the capture of three very rare insects at this place, two of which have never been observed here before. They were all taken during this present month; namely, one specimen of *Vanessa Antiopa*, which was captured by a boy, in a garden in the town, on the 26th inst. A single specimen of *Argynnis Lathonia* was caught on the 2d, near Caistor-rails, about a mile from this town: it adjoins Caistor-marrams, which, I am told, is very similar to the Castle-meadow, Dover, as to soil and vegetation. The other insect is *Deilephila Galii*, of which only one instance occurred till this month, when it has been observed rather common: one was caught on the 3d, two on the 9th, and one on the 29th; besides which five or six more were seen, but so shy that they escaped: with

one exception, they were all seen in gardens on honeysuckles. Two that were caught proved females, and laid eggs, from which I have now several caterpillars by me, feeding on the *Galium verum*.

I remain, Sir,

Your most obedient servant,

Great Yarmouth, August 31, 1834.

C. J. PAGET.

37. *Captures*.—Want of space compels us to compress various notices of captures. *Colias Electra* has appeared in some abundance in many of the counties; York, Devon, Hereford, Worcester, Dorset, Hants, Sussex, Surrey, Kent, and Essex. *Colias Hyale*, in Northumberland, on the authority of Mr. Standish; at Mickleham it has been taken by Mr. Bennet; at Darent, by Mr. Desvignes; and at Great Yarmouth it has been seen by Mr. Paget; the dates varying from the middle to the end of August. *Argynnis Lathonia* has been taken in Northumberland, on the authority of Mr. Standish; and at Mickleham, by Mr. Bennett, the end of August—rather a wasted specimen. *Melitæa Dia* has been taken, two following years, by Mr. Weaver, of Birmingham, at Sutton-park, near that town, and also by Mr. Stanley; the locality we cannot state. *Polyommatus Arion* was taken on the 15th of June, 1833, in a situation abounding with long grass and brambles, at Langport, near Taunton, by Mr. John Queket; in number, about forty specimens: on the same day, in the present year, Mr. Queket took about twenty specimens; Mr. Dale has taken about ten specimens. *Deilephila Galii* has been taken by Mr. Smith, near York. *Agrotis radia*, by Mr. Newman, at Deptford, on palings. *Agrotis radiola*, by Mr. Newman, at Deptford; by Mr. Doubleday, at Epping; by Mr. Standish, at Camberwell. *Agrotis nigricans*, by Mr. Standish, in the Deptford-marshes, in great abundance. *Ceratina cærulea* has been taken by Mr. Davis, at Birch, and by Mr. Newman, at Birch-wood and Wickham; all between the 20th and the end of May. *Tarpa Panzeri* has occurred on Plumstead-heath, on the authority of Mr. Shuckard. *Lamia Sutor* has been taken at York by a boy, and since purchased by Mr. Meynell. *Chrysomela Hanoverensis*, *Spercheus emarginatus*, *Hygrotus decoratus*, *Macrolea Zosteræ*, at Askem-bog, on the authority of Mr. Preston. *Carabus clathratus* and *glabratus*, in abundance in Suther-

land, by Mr. J. Wilson. *Plinthus caliginosus*, at Ramsgate, by Mr. Leplastrier. Mr. Weaver has found the pupa-case of *Cicada hæmatodes*; it was attached by the legs to the stem of a fern; he conjectures that the larva feeds under-ground, on the roots of the fern. Mr. Iliff has bred splendid specimens of *Phalæna Cecropia*, from pupæ received from North America.

38. *Mode of killing Insects*.—"What a cruel practice!" frequently exclaims the spectator, when he beholds an entomologist's box, in which a fine *Bombus*, or other lively insect, is impaled upon a pin, and whose futile exertions to extricate itself produce the semblance of agonized writhings. My present object, however, is not to moot the broad question of insect feeling, but to quiet the apprehensions of those humane individuals whose fine sympathies are called into action by a practice (as above alluded to) which savours more of cruelty than humanity. You will perhaps, therefore, M. Editor, allow me to mention an expeditious, certain, and not unpleasant mode of destroying vitality in the little objects of our research—a plan communicated to me by my friend F. Wood, Esq.; one which, from having recently tried its effect, I can safely recommend for adoption; and may be resorted to in almost every situation, unaccompanied by the danger attendant upon employing the active poisons,—such as the nitric, oxalic, or prussic acids, which are frequently used,—the inconvenience resulting from the change of colour in the species when sulphur, &c. is employed,—or the smell from tobacco, &c.

The plan is simply this:—Take three or four juicy leaves (the younger the better, with, if a more powerful effect is required, a small portion of the tip of the stalk,) of the common laurel; break or cut them into small pieces, and crush them quickly between two stones,^a in a thin piece of paper; screw up the produce in the latter, with as little exposure to the air as can be avoided, and fix the mass by a pin in a corner of the collecting box in which the living insects are to be previously placed; keep the box closely shut, and in about five minutes every specimen will have expired. It is necessary that the external air should be excluded, otherwise the fumes

* At home a mortar may be employed.

of prussic acid, which are evolved from the crushed leaves, will become too much attenuated to affect the respiratory organs of the insects, and the latter will partially revive if too speedily exposed to the vivifying influence of a purer atmosphere. I have tried the experiment rather extensively upon insects of various families: *Bombi* and *Helophili* die very rapidly in less than two minutes, and without any struggling, as is the case when heat, &c. is applied; and moths, in a state of repose, expire without a single previous motion: consequently the process I have recommended is most admirably adapted for killing the larger *Lepidoptera* almost immediately upon their capture, and thus fine specimens may be conveyed home uninjured. I yesterday killed a gigantic *Epeira diadema* in less than half a minute; and a specimen of *Helops cæruleus*, with one or two fresh-captured *Philonthi*, at liberty in the box, were also dead when it was opened. I therefore strongly recommend the above process to the notice of the practical entomologist, as being, from its convenience, better adapted for general application than any hitherto proposed.

J. F. STEPHENS.

*Hermitage, South Lambeth,
17th Sept. 1834.*

39. *Capture of Nyssia zonaria*.—This beautiful and remarkable addition having been made to our British *Lepidoptera*, and Mr. Eveleigh, the President of the Banksian Society of Manchester, supposing it to have been an entirely new species, having most kindly brought to town three specimens purposely for description in this Magazine, among my "Entomological Notes;" I immediately submitted them to the notice of Mr. Stephens, who had never seen any thing like them before. I then applied to Mr. Children, whose entomological library I knew to be unrivalled in this country, and who, with the most prompt kindness, informed me the insect was the *zonaria* both of Hubner and Duponchel. A single specimen of the male was taken on the rushes about half a mile below Black-rock, near Liverpool, in September, 1832; and about the middle of the same month, in the following year, from twelve to twenty specimens of the same insect, both males and females, were taken in the same locality. The captor is Mr. Nicholas Cook, of Liverpool. The following is a description of the insect:—Antennæ, with the ciliæ black, the shaft white: pilosity of

mesothorax very long, dark brown, with two longitudinal white lines, and a dash of white at the base of each wing: body nearly black, with six delicate rings, of a pinkish yellow colour: fore-wings brown, with two oblique, transverse, white lines nearly parallel with the exterior margin, and within these are irregular white markings on the disk; hind-wings white, with two broad bands, and the nervures brown: legs black, the tarsi annulated with white. The female apterous, with seven rings on the body. The size is, as nearly as may be, that of *N. hispidaria*. I shall be glad to show the specimens to any entomologist who may wish to see them.

EDWARD NEWMAN.

40. *Capture of Georyssus pygmæus*.—SIR, When engaged in collecting fossils in the cliffs, at Walton-on-the-Naze, Essex, about a month since, I came upon a spot where numerous plants of *Tussilago furfara* and *Epilobium hirsutum* indicated the presence of water filtering through the cliff. A large mass of half indurated clay attracted my attention, from having many minute particles of clay or mud apparently animated, and slowly moving upon its surface. With some trouble I succeeded in picking up and bottling two of these, and, on subsequent examination, proved them to be specimens of *Georyssus pygmæus*, bearing masses of clay larger than themselves, and thus entirely concealed. I regret not getting more, as I believe it is by no means a common insect.

If this notice is worth putting in a corner of your Magazine, it may draw the attention of entomologists to this insect in similar situations.

Yours, &c.

W. CHRISTY, Jun.

Clapham Road, 15th Aug. 1834.

41. *Wilson's Entomologia Ediniensis*.—SIR, A moment's reflection will, I think, convince you that what has been said of this work, at p. 222, is not quite in unison with the usual candour of your Magazine. It is perfectly true that it contains a great number of the "commonest London insects;" but is this any fault of the author's? or does this fact, in the slightest degree, diminish the value of the work as a local fauna? Assuredly not. If the work professed to give an account of those insects only which were peculiar to the

neighbourhood of Edinburgh, the case would be different; nay, the work might have been contained on a single page. To me it appears that this, and all similar catalogues, are particularly useful, not only for local entomologists, but as contributing valuable materials to a better knowledge of the distribution and range of species. Who would have known that these common London insects were also common round Edinburgh, but for this publication?

W. SWAINSON.

13th June, 1834.

42. *A List of described Diptera, new to Britain.*—SIR, The dipterous insects contained in the following list have not, as I believe, been hitherto recorded as British. If you deem its insertion of any value, it is at your service.

I remain yours, &c.

London.

F. WALKER.

Chironomus leucopogon, <i>Meig.</i>	Tachina pallipes, <i>Fall.</i>	Gymnopa subsultans, <i>Fabr.</i>
ictericus, <i>Meig.</i>	plebeia, <i>Fall.</i>	Chlorops nasuta, <i>Gmel.</i>
Limnobia occulta, <i>Meig.</i>	ignobilis, <i>Meig.</i>	notata, <i>Meig.</i>
Hexatoma nigra, <i>Latr.</i>	vetusta, <i>Meig.</i>	scalaris, <i>Meig.</i>
Zygoneura sciarina, <i>Winth.</i>	egens, <i>Wied.</i>	speciosa, <i>Meig.</i>
Sciara minima, <i>Meig.</i>	luctuosa, <i>Meig.</i>	circumdata, <i>Meig.</i>
nitidicollis, <i>Meig.</i>	laticornis, <i>Meig.</i>	tarsata, <i>Fall.</i>
Mycetophila fenestralis, <i>Hgg.</i>	Musca agilis, <i>Meig.</i>	palposa, <i>Fall.</i>
Scatopse leucopeza, <i>Meig.</i>	tempestiva, <i>Fall.</i>	vindicata, <i>Meig.</i>
brevicornis, <i>Meig.</i>	Anthomyia ruralis, <i>Meig.</i>	Agromyza nigripes, <i>Meig.</i>
Dilophus albipennis, <i>Meig.</i>	variata, <i>Fall.</i>	ornata, <i>Meig.</i>
Sargus pallipes, <i>Meig.</i>	ciliata, <i>Fabr.</i>	latipes, <i>Meig.</i>
Callomyia speciosa, <i>Meig.</i>	cunctans, <i>Meig.</i>	exigua, <i>Meig.</i>
Rhagio notata, <i>Gürth.</i>	varicolor, <i>Meig.</i>	pusilla, <i>Meig.</i>
Empis nigratarsis, <i>Meig.</i>	compuncta, <i>Wied.</i>	amena, <i>Meig.</i>
Hilara thoracica, <i>Macq.</i>	Cordylura flavicauda, <i>Meig.</i>	variegata, <i>Meig.</i>
Ocydromia nigripennis, <i>Fabr.</i>	liturata, <i>Wied.</i>	Phytomyza nigripennis, <i>Fall.</i>
Hemerodromia oratoria, <i>Fall.</i>	Sapromyza albiceps, <i>Fall.</i>	obscurella, <i>Fall.</i>
Elaphropeza ephippiata, <i>Fall.</i>	Lauxania Elisæ, <i>Wied.</i>	atra, <i>Meig.</i>
Drapetis nigra, <i>Meig.</i>	Sciomyza fuscipennis, <i>Meig.</i>	agromyzina, <i>Meig.</i>
exilis, <i>Meig.</i>	obtusata, <i>Fall.</i>	albipennis, <i>Fall.</i>
exilis, <i>Macq.</i>	Tetanocera reticulata, <i>Meig.</i>	affinis, <i>Fall.</i>
Platypalpus ciliaris, <i>Fall.</i>	punctata, <i>Meig.</i>	rufipes, <i>Meig.</i>
longicornis, <i>Meig.</i>	Helomyza olens, <i>Meig.</i>	notata, <i>Meig.</i>
flavipalpis, <i>Macq.</i>	griseola, <i>Meig.</i>	præcox, <i>Meig.</i>
articulatus, <i>Macq.</i>	Notiphila nigriceps, <i>Meig.</i>	fasciata, <i>Meig.</i>
flavicornis, <i>Meig.</i>	calceata, <i>Meig.</i>	albiceps, <i>Meig.</i>
rapidus, <i>Meig.</i>	nigrina, <i>Meig.</i>	terminalis, <i>Meig.</i>
Lonchoptera rivalis, <i>Meig.</i>	nigella, <i>Meig.</i>	pallida, <i>Meig.</i>
flavicauda, <i>Meig.</i>	Drosophila littoralis, <i>Meig.</i>	flava, <i>Meig.</i>
Tachina longicornis, <i>Fall.</i>	Ochthiphila Juncorum, <i>Fall.</i>	Phora opaca, <i>Meig.</i>

43. *Mode of destroying Ants.*—These modes for destroying them, or attracting them to the end of their being destroyed, have been published in the Gardener's Magazine, V. 730. VII. 315. Baits: the refuse part of melons, slices of raw turnip rubbed over with honey, recently cooked bones of roast or boiled meat or fish. Poisons: a well-compounded mixture

of equal parts of loaf sugar, oxyde of arsenic, and well pulverized white bread, strewed as occasion may require, both as to time and quantity, in the haunts of the ants. The mixture to be kept in a bottle dry for use.—*J. D. in Loudon's Magazine of Natural History.*

44. *Ophrys Apifera*.—I have been fortunate in discovering this beautiful plant in great abundance, on the skirts of Birch Wood, among fern and heath, in that field on the further side of the wood, which most entomologists know as the one where *Endromis versicolor* has so frequently been taken; by looking carefully along the margin of the wood it will be readily found. Is not this a nearer London habitat than has yet been recorded?—fourteen miles.

E. N. D.

45. *Question respecting Names*.—SIR, May I trouble you for the names of two butterflies which have appeared here in great abundance during the present month? the first is bright orange-colour, with a wide black border, and frequents the blossoms of lucern; it is a bold butterfly, easily caught, and is about the size of the large *garden-white*. [*Colias Electra*, or the *clouded yellow*.—ED.] The other is marked very much like the *admiral*, but is paler in colour, both above and below; it settles on the lucern and on China asters. [*Vanessa Cardui*, or the *painted lady*.—ED.] By answering these questions you will much oblige a subscriber.

Epsom, Aug. 24, 1834.

JAMES B. SMITH.

46. *Earwigs destructive to Dahlias*.—SIR, You will confer a great benefit on the cultivators of that beautiful plant, the Dahlia, if you will inform them, through your excellent Magazine, what insect it is that devours the petals of the flowers as soon as they expand; and also what remedy is to be applied.

Guildford, Aug. 1.

[The mischievous insect alluded to is the common earwig. *Remedy*.—Place a small quantity of hay in a very small flower-pot; invert one of these flower-pots on every stake to which a Dahlia is tied; the earwigs will seek these for roosting-places at the approach of daylight, and may thus be entrapped, and every morning shaken out and destroyed.]

THE
ENTOMOLOGICAL MAGAZINE.

JANUARY, 1835.

ART. XL.—*Colloquia Entomologica.*

NOTE.—Last night I dreamed a dream! I had been correcting some proofs—delicious occupation!—till an early hour, and then I leaned my head on the table, and fell asleep; I was instantly wafted into what appeared a land of spirits, and that which followeth passed before me, as nearly as my memory serveth me.—C. S.

SCENE—*An open Plain in Elysium.*

STOMENTOMOLOGUS and LEPIDOPTEROPHILUS.

STOMENTOMOLOGUS. A Briton! Oh, I joy to meet with one so newly landed from a realm I loved, and more than this, if more need be desired, fraught with the knowledge that I most esteem.

LEPIDOPTEROPHILUS. Stranger, thou dost delight me; who art thou? fain would I question thee of what I see.

STO. Stomentomologus my name on earth. Ask what thou wilt, and I will promptly tell all that I know; yet this were idle toil, admitted here no knowledge is withheld, and soon thou wilt perceive instinctively all thou wouldst wish to know; still ask, and I will then demand of thee concerning earth and its inhabitants, for 'tis of these alone we nothing know but by the voice of those who wander thence, when they no more can linger on that sphere.

LEP. Explain, Stomentomologus, what are those forms so beautiful, yet plainly armed with fearful strength, on which

across the plain my fellow mortals ride, immortal now: are then the animals of yonder earth admitted here? It is most strange!

STO. Why strange? here each pursues unchecked his favourite theme. Wouldst thou exclude the beast, the bird, the fish? the hum of insect life? Wouldst thou hew down those groups of graceful and most lovely palms, waving in measure to the tuneful breeze? or these delicious shrubs, oppressed with fruit, or clad in beauteous bloom? Wouldst thou destroy the mossy turf on which we now recline? wouldst still this breeze? wouldst dissipate the balmy perfume that around exhales from thousand fruits and flowers? Or wouldst thou evaporate these limpid streams, that flow like molten silver? Wouldst thou exhaust the delicate air we breathe? Or wouldst thou hide that glorious sun, a sea of life and light, because such things are shadowed forth on earth?

LEP. Ah, no! and yet on earth we fondly paint our wished-for heaven a scene of clouds alone.

STO. Yes; and they represent immortal man as dwindled to a sprite, a head with wings! of angels such is their sublime idea! How far below the truth exemplified in yonder God-like, mammoth-mounted forms.

LEP. Hah! they salute thee! see!—their noble beasts, proud of their riders, scarce indent the turf! How do they guide them?

STO. Solely by the will! The riders are inseparable friends: Aristoteles, with the coal black beard; Raius, a Briton, on the further side; Cuvier, the noted Gaul, on this.

LEP. And all so young!

STO. Observe that perfect form, irradiate with light: mark well her mien, and the rich glories of her golden hair: she plucks the tempting fruit with timid hand from the o'erladen branches of yon tree, and gives it to that melancholy man. These have transgressed; and yet their only doom is, that through all this wilderness of bliss the memory of their error yet remains.

LEP. How very beautiful, and yet how sad!

STO. Most bright indeed are they, yet pure as bright, and pure, without offence we here admire the vision of such matchless excellence: here beauty is in mind; the child of mind; a bodied emanation of the thought; itself enchanting, but it

mostly owes one half its lustre to the mental eye of him who gazes.

LEP. Stomentomologus, the princes shew, the kings, the emperors, where is there abode?

STO. Alas, my friend, they hold no sceptres here! if any come (the fact I never heard), they all must mingle with the countless throng.

STO. Come, shall we mount on these gigantic elks (see how they winny and invite the hand), and gallop to the soft and perfumed shade of yonder distant wood, awhile to hide from our unclouded sun's too warm embrace; thither at noon-tide myriads repair.

LEP. 'Tis not my wont to ride.

STO. Linnæus, ho! ecce discipulus!

LEP. Is that Linnæus with a butterfly? surely we may not capture insects here!

STO. Indeed we may: we do whate'er we chose—the will to err is now extinct within; we capture and admire, but do not kill.

LEP. I wish that I had brought my emperor net.

SCENE II.—*An open Plain in Elysium.*

GALILEO and NEWTON.

GALILEO. It were not well to wish, or I could fain desire the instrument I had of yore to mark the passage of that beautiful orb across the solar disk.

NEWTON. It seems on fire. We cannot here judge of degrees of heat. Oft have I fondly dwelt upon the heat of this bright planet where we dwell in ease—ease, ay, in luxury the most profound; 'tis not for man to venture on so far with idle speculation.

GAL. That I know. Experience schooled me pretty thoroughly: my freedom was the forfeit that I paid for too great daring.

NEWTON. Superstition's veil had darkened your maligner's powers of sight; my land, somewhat emancipated, conferred her honours for the very thoughts that led you to a jail.

(*Manent.*)

SCENE III.—*A mossy Bank in Elysium, a thick Wood behind, a large Lake in front.*

ARISTOTELES, RAIUS, LINNÆUS, CUVIER, and LATREILLE.

CUVIER. One of our brethren has arrived from earth: his name is Lepidopterophilus.

LATREILLE. His *Lepidoptera Britannica* I recollect, a very worthy book: Carolus Linnæus, thy follower.

CUV. I saw him with thy brilliant friend of Kiel, Fabricius Stomentomologus.

LINNÆUS. To whom I ever bow in duty bound, and to my worthy Raius whose name in every honour should take place of mine.

CUV. Time will accomplish all things that should be. Raius is great, great is Linnæus too; time will advance the one to higher fame, but thine, Linnæus, never will be lost; Aristoteles to the end of time shall stand unrivalled, but the kindred names Raius and Linnæus shall be twins in fame.

ARISTOTELES. Fair modesty herself might sit enshrined on Cuvier's brow! Pray, where stands Cuvier's name? where stands *his* name who in a single map displayed the vast creation? Where his name, whose wondrous skill defined each iota composing mortal frames, who, not content with things that live and breathe, dived deeply down, examining the bowels of the earth, and with a superhuman intellect described the beings of another world? Yon mammoths sporting in the grateful pool, and lashing up the water into foam; and those fish-crocodiles, with lustrous eyes, beyond proportion large, and scaly fins; (mark that immense one, basking in the sun, outstretched upon the bank!) ten thousand birds, like Egypt's sacred Ibis, or the stork that seeks the fellowship of ruling man, or soft sultana, purple, plume their wings, or monopedate and immovable stand, without crowding on the creature's back: those graceful forms which undulating flit amid the festoons of the glowing vine, part bat, part bird, part Saurian reptile, scaled as though in armour clad, pursuing swift those many-tinted habitants of air, that rest on perfumed zephyrs in the sky—that live on dew-drops falling in the morn, caught e'er they reach the mossy earth we tread, each drop becoming rainbows in their

plumes,—those were to him familiar as the beings of the day.

LAT. As Rains for Linnæus did unfold a mighty plan Linnæus did perfect, Aristoteles was the first who drew an outline of the whole, which Cuvier filled; Aristoteles and my Cuvier wear a first and equal crown in fame on earth.

(*Manent.*)

SCENE IV.—*A thick Wood in Elysium.*

STOMENTOMOLOGUS and LEPIDOPTEROPHILUS.

STO. Now, Lepidopterophilus, survey this beauteous scene; above our heads behold the interwoven boughs, meeting in arch, pointed, or Gothic, as we said of yore; luxuriant leaves, in tint and graceful form more exquisite than erst on earth we saw, while luscious fruit in purple clusters hangs. See climbing plants, with slender tortuous stems, snake-like enfold the trunks: expanding wide a thousand blossoms, crimson, white and blue, shed the rich perfume on the scene below; beneath clusters the brushwood, rich in fruit and flower; each fruit a ball of gold, each flower a scarlet tube, offering its sweets to the long suckers of those gold-green bees, radiant as light; and beetles, well encased in gorgeous armour!

LEP. And such butterflies! What words can paint their ever shifting hues? what eyes can gaze on such resplendent tints; and what are those divinely blazing gems? The emerald, ruby, and the amethyst, the rich carbuncle, and the diamond pure, emitting colourless and liquid light; vaulting they rise, and undulating fall, like a glad company of gnats at even. Tell me, my friend and leader! what are those?

STO. Those graceful beings to the feathered tribe belong; their forms are found amid the flowers that deck Columbus' land. But turn this way, observe those birds magnific, with slow step, of grandeur conscious, coming from the brake; compared with these, e'en India's peacock pales; and hark! in concert all their voices join harmonious, each to each so well attuned, as when the sackbut and the deep bassoon mix with the breathings of the gentle flute, the hautboy sweet, and the loud trumpet's call.

(*Manent.*)

SCENE V.—*Another part of the Wood, very shaded.*CUVIER and ARISTOTELES *reclining on the ground.*

CUVIER. Among the errors mortals still commit, of those who follow science' paths I speak, the chiefest seems to me that doubtful line they draw 'twixt Nature's self and Nature's God: Nature they worship as a sovereign power, distinct and independent; nor admit God the great cause, and Nature the effect.

ARISTOTELES. God is Creator, Nature his create: life, light, and being, emanate from him. How is it that the human intellect can dare to doubt so obvious a truth? 'Tis but a pagan fable, that would make a ruling nature, deify a work; yet Cuvier says,—immortal Cuvier says, and saying, seems by heaven itself inspired,—that *Nature* thus demonstrates her results, and things like these (*pointing to a group of mammoths*) are *her* experiments.

CUV. And *Nature* is not!—where then was the good of thus deluding others with a dream?

ARIS. O! were it possible again to stray to yonder earth, forsaking these bright realms, and pour out all the knowledge we have gained, to unfold the beautiful and simple plan on which the Omnipotent has made all these wonderful forms linking together oft beings, whose structure made e'en Cuvier pause; the patient camel, isolate no more, the tall giraffe, and that strange paradox, to me unknown, except from thy discourse, now become links, which wanting, the great plan would seem imperfect.

CUV. Thou dear enthusiast! pause not—

ARIS. I must pause; the thought has vanished ere it was a wish.

CUV. 'Tis not impossible for man to learn the mighty plan on which the whole is formed, and it is best that he himself should learn, without a visit from departed souls. Newton has done as much—laid down the laws by which the Almighty governs rolling worlds; and others long before had dimly seen the obvious dawnings of the mighty truth.

ARIS. The boundary line how slight that separates e'en

man himself from yonder sportive crew, surpassing us in size, and armed with strength of body greater, and of mind scarce less, yet bowing down submissive to our will, and worshipping in us our Maker's likeness.

Cuv. And here the line seems slighter than on earth: there what a power was gained by artifice! Here every want abundantly supplied: the genial air precludes the use of clothes, the teeming soil supplies abundant food, and memory is more than written books; and all these there we gained by artifice, and gaining them, displayed a difference greater than now appears. It was the mind aiding forbidden lusts, by artifice aiming at lawless power, that assumed the right to take, to injure, to destroy, all that it lusted for, and, drunk with power, sung its own praise; to hide its impotence, forged fetters, to keep others weaker still, and reigned by superstition o'er its kind.

ARIS. Reason, the highest gift of Providence, and most abused on earth, here reigns supreme; or rather, for none reigns supreme but One, it is the minister by which He reigns. Reason's eternity is here begun; 'tis reason teaches what we owe to Him, 'tis reason shows our duty to mankind: but reason is not ours exclusively, all that reflect possess it; man, indeed, the larger portion, but these creatures each in some degree. My Pyttalus, who knows my every will, is not without his share; for reason is no other than the power that from an obvious cause draws inference.

Cuv. And therefore 'tis not reason in the bee that builds her waxen cells; the Maker rules in her by other means more potent still: your Pyttalus or my Mimallones vary each action with the circumstance, they think and act, she acts and never thinks, but builds unceasingly her hexagons.

ARIS. Oh! hadst thou seen the steed Bucephalus, how well he knew that daring, glorious boy—glorious before his hand was dyed in blood. Ah! how I loved that boy, and he loved me! he listened and he learned; but blood, alas! erects a barrier between earth and heaven. It is a weakness, but the rising tear is ever ready when I think on him.

Cuv. And I, too, have a noble warrior known, whose name, with Alexander's, will be heard while time endures on earth: his giant soul strode over empires, trod on empires' dust. I never once addressed him but I felt here is my master mind;

my spirit sank not, but yet I always felt that it was looking up—a feeling, but with him, I never knew.

ARIS. He had been great indeed, but checkless power o'erthrew the even tenor of his soul, his mind became inebriate and vague, and mad ambition wasting from within, like some volcano's subterraneous fire, conquered the conqueror of half the world; and worse than this, excludes his soul from heaven.

CUV. Aristoteles, dost thou say that blood erects a barrier betwixt earth and heaven? where then can be that meek, yet noble form, with graceful step, and such a heaven-born brow, engaged in converse with the man who found another world, and that world's glorious child, who, like Prometheus, drew down fire from heaven; has that right hand been never dyed in blood?

ARIS. Washington!

(*Manent.*)

SCENE V.—*Another part of the Wood.*

ARISTOTELES, and other *Naturalists.*

LATREILLE. Welcome to thee and thine, Fabricius; of all who ever wrote on insect life, whether in scholarship, or deep research, or clear description, thou art far the first; thy matchless page, in graceful language clad, must ever please as much as it instructs. Hail, sovereign of entomology! thou ever welcome one! and welcome to this learned Briton, not to me unknown.

STOM. His name is *Lepidopterophilus*.

CUV. My *Lepidopterophilus*, although on earth I never heard thy honoured name—honoured I doubt not but it must have been—so limited my knowledge of my kin, for all in science are of kindred blood, still art thou not less kindly welcome here. Thine was a portion of the great pursuit; and it is by such laboured works as thine, that the great whole is into harmony arranged by others, who decline the task of working out each separate tribe complete: Aristoteles, Raius, and myself, alas! how wide the difference between! range o'er the whole, nor perfect any part; whilst this my dearest friend, Latreille, Fabricius, Stomentomologus, and thou, my *Lepidopterophilus*, perfect the parts; your part, the insect tribes. But

tell me now, how in that rising land our darling science thrives? Does Swainson write? Swainson, that master of a gifted pen, the first in fame of those I left behind; his country's honour, and his age's pride.

LEP. He writes but little, but his pencil speaks; and to the gazer's eye, the history gives.

CUV. His rest must, then, be as a giant's sleep; he will arise anon, and shake the land.

LAT. And Kirby! my illustrious compeer? how my heart beats to clasp him in my arms!

LEP. His "Introduction" was his last great work, a monument of labour! 'twill endure to distant times. Immortal Cuvier! think on the importance of this noble work! nearly two hundred names unknown before invented in anatomy alone!

RAIUS. Immense! how cramped and limited the store when first I ventured on description's path! but how could these, Fabricius and Latreille, have left two hundred parts unseen, unknown?

STO. Were there two hundred parts unnamed before?

LEP. No! but he gave them more important names—he gave them better names—much better names!

STO. My *Lepidopterophilus*! excuse my doubting of the value of such change; this is the plan that I would recommend: a name once given, let that name abide, for who is to decide which name to use when every publisher invents a new? Thou deem'st his merit what I deem his fault, a too great readiness in giving names; yet is thy Kirby a philosopher, and when he comes into the land of bliss, we shall crowd round, and claim him as a friend.

MARSHAM. So, *Lepidopterophilus*, you stayed to finish up your task before you came?

LEP. Marsham! alas! I was but poorly versed in the concluding part,—the little moths.

CUV. But I must ask you of the Doctor Leach; there lives no man on earth of equal mind—disinterested, pure, and generous; of keen perception, and of judgment sound; his was a task from which all others shrank.

LEP. He is a wanderer in foreign lands.

CUV. And young Mac Leay, the learned man of fives! say,

does he live and write? and also say, does he pursue quinarism still?

LEP. He lives, though in a very distant land: he writes little and seldom; he may read the more; as to the fives, I never hear of them: is there not music on the evening air?

RAIUS. A sound of voices! 'tis the choristers who offer welcome to each happy soul that comes amongst us; yonder they approach.

(Enter little children, very beautiful, they chant in voices softer than flutes, as they mingle with the spirits, and approach Lepidopterophilus.)

CHILDREN. (*Chant.*) Hail! son of science, hail! hail! pilgrim; thou art welcome here, a traveller from yonder sphere, (*they stretch their little hands towards the earth, which is shining between the trees,*) its pains henceforth no more assail thee! yet its blessings shall avail thee! hail! son of science, hail! The fate that bade thee die, worked only for thy good: affection binds us with the tie of holy brotherhood, and though our friends on earth were dear, e'en friendship's bond draws closer here; of friendship pure, like ours, the birth is after spirits leave the earth. Welcome here! each child of clay, who from yon dwelling finds his way to where the spirits of the blest have entered their eternal rest.

[The children run away laughing.]

ARIS. How sweet to hear those little voices raised in an according and melodious strain, just when the shades of evening wander forth to cool the air and renovate our frames!

STOM. (*Chants.*) Sweet is the hour of evening, softly blending the hues of golden day and silvery night, when each for empire seems awhile contending, and air is glowing with a purple light, that moment after moment grows less bright, as hope 'gainst reason striving fades away, yet hardly yields to be extinguished quite, so witchingly she holds her cheering ray, to lure misguided wanderers from their heavenward way.

RAIUS. 'Tis sweetly sung, and worthy of thyself; list, while I chant the praises of a smile. (*Chants.*) Bright as the day that breaks anew, bright as the opening flow'et's hue,

bright as the sky above us, bright as the drop of sparkling dew intensifying heaven's blue, is the smile of those that love us.

LEP. Oh, help me! hold me, friends—I sink—I faint—how hard to bear is perfect happiness!

(*And here I awoke.*)

ART. XLI.—*Remarks on various Insects.* By DELTA.

Léandre (à Dandin.)

Il est fort ignorant.

L'Intimé (à Dandin.)

Non pas, monsieur, non pas.

J'endormirai, monsieur, tout aussi bien qu'un autre.

RACINE. LES PLAIDEURS.

SIR,—In a former letter to you, I gave a short account of the habits of *Nonagria Typhæ*; but as that was rather imperfect, I beg leave to add a few words to it, trusting that you will not consider me to be trespassing too much on your pages. In that letter I left the pupa shut up in the *Typha* stem, like damsels were in former times in the trunks of trees, and other such localities; and so far as you could judge from my story, the moth had no more chance of escaping than they had, unless some entomologist acted the part of the knights errant, or the magicians of those days. But there is a way opened for it, of which it avails itself in due season. This I will now explain.

When the larva attacks a plant of the *Typha*, it eats downwards just in the centre, until it reaches nearly to the root, often some inches below the water. By this time it has almost attained its full growth; but if it were to undergo its metamorphosis there, how could the moth escape? Upwards it would be impossible; because the larva, when it entered, was very young, perhaps not near half grown, and the opening it made is far too small for the size of the moth; and were it to con-

tinue its downward course, and there make an outlet, it would admit the water, and be drowned; in fact, notwithstanding the precautions of the larvæ, many pupæ were drowned this year, by the sudden rise in the ponds, caused by the heavy rains we had in July. But instinct, or something else, points out to it the course which ought to be followed; and at this stage of its growth it turns round, and proceeds upwards, enlarging its old track; and by the time it has arrived a few inches above the water, it is full grown.

About two inches below the place where it means to spin, it gnaws quite through to the outside of the stem, closing this opening, which is generally of an oval form, with a slight web of silk, to which it glues some of the fragments of leaves or stem which it has detached. It now commences its web, which I have before described. In this the pupa is suspended by a thread, about two lines long, with a small cup-shaped termination, which invests its telum, or last segment. I am at a loss to conceive how the pupa attaches itself to this thread after it has thrown off the skin of the larva. It is a very different case from that of the *Nymphalidæ*, because there the larva covers a considerable space with silken threads; and the pupa, grasping part of the skin of the larva between its segments, can thrust its well-armed telum into any part of this network, with a certainty of gaining sufficient hold. But the telum of our pupa, furnished with only a few slight tubercles, must be inserted into a little cup, not above three-fourths of a line in width; certainly no easy task. I hope to be able to clear up this point next year; but I must beg such of your readers as have an opportunity, to observe for themselves, as I may chance to be unsuccessful. The pupa being thus fixed by its last segment, with its head downwards, the moth easily extricates itself, and a few steps bring it to an opening by means of which it can escape from its confinement in the stem.

Here let me advise such of your readers as are desirous of obtaining pupæ of our insect, not to be guided solely by the yellowness of the younger leaves, but also to observe whether there is a hole at the side of the stem, and whether or no it still remains closed, since, if they neglect this, they will be sure to waste much time in opening stems deserted by the larva, or which the moth has quitted; and it is by no means desirable, even in summer, to stand longer than needful half way up to

the knees in mud. This year I obtained about forty pupæ in three hours; of these some turned in the last week of July, more in August, and a few not until September. I do not remember to have captured half a dozen specimens of the perfect insect in my life, although I have bred scores. From this I infer, that if other localities were well searched, some of the other species of *Nonagria* would be found to be less rare than they are believed to be; at any rate, this is well worth the consideration of entomologists, who have means of examining *Typhæ* and other cognate plants in localities where *N. Crassicornis*, *pilicornis*, &c. have been taken.

As in all probability this is the last letter I shall trouble you with for some time, I will just mention one or two other trivial matters, which may perhaps amuse some of your readers, who, like me, instead of

——— Drinking deep, deep at Philosophy's shrine,
Their time with the flowers on the margin have wasted,
And left their light urns all as empty as mine.

Several years ago, I fully resolved that I would make out what the larva of *Meloe* really is. I had read various accounts, not very satisfactory, and felt sure that there was some error, which I could easily detect. I was young then, and had much to learn. It is but rarely that we see a *Meloe* in this neighbourhood (not Colchester), but after diligent search I found a few *proscarabæi* of both sexes. These I placed on some light earth, under a bell-glass, giving them plenty of *Ranunculus acris* to feed upon. The females, in particular, fed well, and grew wonderfully large in the abdomen; therefore I felt sure that I should soon have lots of good eggs, and then of course lots of larvæ, which would not be mere *Acaridæ*, but *bonâ fide* young *Meloes*. Alas! my hopes were too high, and I was doomed to disappointment in this as I have been since in every favourite scheme! One morning I found that something particular was going on amongst them. The old ladies, no doubt, with much exertion, had scooped out places in the earth wherein to bury their eggs; and soon after, a lump of bright orange eggs, about the size of a *Palma Christi* seed, was deposited in each, and carefully covered over. This was just what I had expected, from what I had read about this matter. I now set the mould aside, keeping it a little moist, and covered up so

that nothing could get at it. Thus it remained for about two months, when out sallied a host of little animals, of a light brown colour, having as near as may be the shape of Kirby's figure in the *Mon. Apum*, which ran about the glass as swift as a Yankee pony,^a allowance being made for their difference in size. If I am not much deceived, I saw some of these actually making their way through the egg shell. I put a lot of them into a glass jar, with some *Ranunculus* leaves and some flies, principally *Syrphi* and *Muscæ*; to these latter they soon attached themselves, just at the base of their posterior legs, remaining fixed so long as their victims lived. I supplied them with fresh food for some days; but with all their feeding they grew none the bigger, and in about three weeks they were all dead. I consoled myself with hoping better things the next year; but hitherto I have been disappointed, not having seen since that year ten living *Meloes*, and not two in this neighbourhood. A friend of mine, not an entomologist, but a lover of natural history, has told me since, that he once tried to rear the larva from the egg, but met exactly with the same fate as myself. This he was much puzzled at; the more so, as he was unaware of any previous attempt of the kind.

The same year I had better luck with one of my schemes: I resolved to raise a *Stylops*, and raised five (*Dalii*), one of which Mr. Stephens now has. I had noticed that many of my specimens of an *Andrena* (*fulvicrus*, I believe) had the heads of the larvæ of *Stylops* very apparent on their abdominal segments. I therefore examined all I could take, and found many which had larvæ in them. These I shut up in a large chip box, with only a piece of gauze for a lid, giving them fresh flowers every morning before they were awake. Judge of my joy, when one morning I found that two *Stylopes* had made their appearance. Two more appeared a few days after, and another soon followed these. Possibly I might have raised more; but happening to leave home for a few days, my *Andrenæ* all died. I fancied myself the only person possessing this *Stylops*, but soon found that Mr. Dale had preceded me by a few days, and that Mr. Curtis was about figuring it from his specimens.

The *Eristalis* I mentioned in my second letter to you, is

^a Your readers cannot fail to remember the story of the "very severe pony," which was chased three times round a field by a flash of lightning, which at last gave up the chase, "not being able to come within a rod of it."

Mr. Newman's *E. stygius*, which I cannot consider to be identical with *E. æneus*; the uniform colouring of the thorax at once distinguishes them. When at Mersey island the end of last April, I saw *E. stygius* on the flowers near the shore, especially on the daisies, which render the line of turf between the sands and the little wood almost white with their blossoms. I was then attending to birds, but captured a few specimens; none of which had a striped thorax, nor did I see any so marked. A few days after this, I went to Walton with a friend whom I have mentioned in an account of a former excursion to this place, and whose pursuits were ornithological. We took a boat, and proceeded down the creek, occasionally landing to look after the birds. In the banks of the ditches within the salt marshes I found many *Bembidiidæ* and *Octhebiæ*, amongst which were *O. Hibernicus*, and one which appears to me to approach very near to *O. exsculptus* of Germar, if it be not that insect. It certainly does not seem to agree with any of Mr. Stephens' descriptions; but he appears to be in error on some points; therefore I cannot speak with confidence.^b *O. marinus* was the only species which was abundant. We found the *Lichen Caninus* at Stone Point, covered with larvæ, which, from their evidently belonging to one of the *Lithosiidæ*, we concluded to be those of *Setina irrorella*. I filled my boxes with these to take home with me, but I was unable to rear them, though they fed well. Perhaps their constitutions required sea air. Under the sea weeds we found *Po. chaldeus*, several *Amaræ*, *Dromius bifasciatus* and *melanocephalus*, a *Dyschirius*, and many other *Coleoptera*. *Broscus cephalotes* abounds in deep holes in the sand, where it lies hid all day, as do the *Scaritidæ*, to which it certainly is allied in habit.

When we came nearly to the cliffs we again found *E. stygius*, but not one *æneus*; and although the former is common during autumn at Walton, the latter is not to be found with it, so far as I can learn. We met with nothing particular in the ornithological line; but, nevertheless, returned to the hotel well pleased with our walk. After a short rest, we walked along the base of the cliffs to the right, until the darkening twilight and the rising tide warned us to return home. We then climbed the cliff, intending to return by the footpath, but this we found had been washed away by the sea in the winter. We, however,

^b Compare his description of *O. bicolor* with that of Germar, whom he quotes.

made our way back as well as we could in the dark, over hedge and ditch; but just before we reached Walton the moon rose in splendour from the sea, not pale and silvery, but of a glorious red; one might have imagined that she saw the flocks of sheep on the cliffs, and blushed to remember that she had loved Endymion. It was a most lovely hour; not a breeze was stirring, and all things were hushed, save the soft murmurings of the sea, which beat gently at the base of the cliff, on whose edge we were standing; nothing was to be seen in the heavens, save the moon and a few stars, "the companions of the chariot of peaceful night." Truly, at such a time—

There is a rapture on the lonely shore,
There is society where none intrudes
By the deep sea, and music in its roar;
I love not man the less, but Nature more,
For these our interviews, in which I steal
From all I may be, or have been before,
To mingle with the universe, and feel
What I can ne'er express, yet cannot all conceal.

But if such moments are delightful when alone, how much more so are they when we have a friend with us imbued with a poet's feelings, whose thoughts are as our own in our best of moods, and whose bosom glows with the best feelings of which the heart of man is capable! These are moments which indemnify us for years of the toils and cares of life; the recollection of these will—

Run molten still in Memory's mould,
And will not cool
Until the heart itself be cold
In Lethe's pool.

Who is there that, looking back on times like these, will not exclaim, "*L'amitié est l'amour sans ailes?*"

I am going astray from my subject, and must return to Entomology; but before I leave speaking of Walton, let me just record a fact which, though not connected with Entomology, may interest many of your subscribers. On the second of last October, Mr. H. Doubleday, whilst in company with three ornithological friends, killed, on the cliffs near the towers, a specimen of the grey-headed yellow wagtail, (*Motacilla neglecta*, Gould,) a bird which was not before known to occur in this country.

Dioctria ælandica does not, I find, feed solely on *Ichneumonidæ*: I have this year seen more than one individual feeding on *Diptera*, but these were all immature.

This letter will appear a little before *Cheimatobia rupica praria*, therefore it will not be out of place for me to remark that I have never found the female of this insect of an evening, although that of *C. brumata* is very easy to be found, in company with the male, on any mild evening in December. But in the morning early, two hours before sun-rise, it may be found in abundance where the males are plentiful, *i. e.* during January and February, on almost every whitethorn hedge. I believe few entomologists to be aware that many autumnal moths hibernate. Besides *Scoliopteryx libatrix*, I am sure that *Glæa polita*, *Calocampa exoleta*, and *Euthalia miata*, hibernate; possibly many more do the same.

It is now quite time that I ended this long epistle, but I must first just tell you that I am not quite pleased with the communications of Corderius Secundus. I do not so much complain of his turning to ridicule my habit of quoting rather too frequently from those poets, whose pages have delighted me from my early years. I know well my failing; and neither Corderius, nor Padre Isla himself, were he to come to life again and ridicule entomologists as severely as he did friars, could cure me of this. I fear even

Hoc siquis vitium poterit mihi demere, solus
Tantalea poterit tradere poma manu.
Dolia virgineis idem ille repleverit urnis,
Ne tenera assiduo colla graventur aqua

What I complain most of is, that Corderius endeavours to identify me with writings in which I had no hand, and opinions which I have never acknowledged, whilst some parts of the colloquy contain so exactly my sentiments, that no one who knows me could mistake the person for whom Erro is meant, without its being stated also that Erro is Delta. Nevertheless, be it known, that Delta and the abstractor of Straus Durckheim are one and the same, and that Erro is the very image of that person, a second self, more like than is my shadow; but as to Rusticus, now again appearing on the stage, I know him not,

his secret is not in my keeping; all the attempts hitherto made to unmask him have been futile:—Vale, Vale!

Yours most truly,

Epping, Nov. 5, 1834.

Δ.

ART. XLII.—*Essay on Parasitic Hymenoptera.*

By A. H. HALIDAY.

(Continued from page 259.)

Of the Ichneumones Adsciti.

GEN. VI. LEIOPHRON.

Palpi maxillares 5-articulati: oculi glabri s. subglabri: alarum anticarum areolæ cubitales duæ; posticarum areola brachialis posterior apice rectâ clausa: aculeus deflexus aut reconditus.

Os breve: mandibulæ apice bidentes, cuneatæ curvatæ, sub clypeo forcipatæ, cum labro os anticè claudentes: labrum transversum: epipharyngis ligula apicalis attenuata prostans; maxillæ lobus membranaceus obtusus: palpi maxillares 5-articulati: articulus 1^{mus}. non perbrevis, 2^{dus}. reliquis crassior, 3^{tius}. plerunque longior: labii lobus integer obtusus: palpi labiales plerunque 3-articulati, rarius articulo penultimo minutissimo aucti: antennarum articulorum numerus varius: facies supra clypeum bifoveolata: oculi glabri vel pilis raris erectis consiti, quarum discrimini speculo subtiliore opus est: ocelli in triangulum: occiput marginatum parum concavum: thorax oblongo-ovatus convexus: abdominis segmenta 2^{dum}. et 3^{tium}. vix manifestè discreta: 6^{tum}. ventrale haud insigniter productum: aculeus deflexus aut reconditus: pedes mediocres; calcaria parva: alæ diaphanæ; anticarum stigma distinctum, areola disci-antica a cubitali discreta, cubitales duæ nusquam coarctatæ, rarius unâ effusæ:—posticarum areola radialis remota (i. e. a brachiali), brachialis posterior anteriore parum brevior, nervo transverso apicis recto.

Colores sæpius nigri nitidi, rarius flavescentes: magnitudo variat: de vitâ et moribus nihil fere constat: larva speciei cujusdam in larvâ boletophagâ Insecti Coleopteri vixerat.

[*Tabula Synoptica Subgenerum.*

<i>Areola radialis</i> <i>alarum anticarum,</i>	{	elongata; an-	remota	1. PYGOSTOLUS.
		tica disci	contigua; Me-	bisulcum 2. ANCYLUS.
			sothoracis scu-	lævigatum 3. CENTISTES.
			tum	
	{	brevissima semilunata		4. LEIOPHRON.

Subgen. I.—PYGOSTOLUS.

Labrum quam sequentibus brevius, epipharyngis marginem antice nonnihil retegens: palpi maxillares articulis 1^{mo}. et 2^{do}, longitudine subæqualibus, 3^{tio}. elongato: labiales 4-articulati; articulus secundus crassus obovatus, 3^{tius}. minutissimus tuberculiformis, 2^{di}. apici exteriori insidens et eccentricus sive cum quarto non connexus, 4^{tas}. elongatus utrinque attenuatus: antennæ elongatæ graciles: oculi globoso-prominuli: caput pone oculos angustius: stemmaticum elevatum: occiput distincte marginatum: mesothoracis scutum sulculis ordinariis incisum: abdomen breviter ovatum convexum segmentum 1^{um}. breve rectangulum, angulis baseos prominulis, 2^{dum}. illo plus dimidio longius (re ipsa e duobus conflatum lineolâ subtilissima discretis), sequentia brevia at non recondita: anus obtusus supra aculeum rimâ verticali supernè patulâ fissus: aculeus deflexus, valvulis linearibus, vagina ensiformi, basi subtus squamulâ geminâ conchiformi suffultus: venter contractus, medio carinatus, segmentis apice elevatis, sexto subretuso: tibiæ anticæ subarcuatæ; pedes posteriores breves: alarum⁷ anticarum stigma anguste trigonum fere lanceolatum, areola radialis in apicem alæ rectâ excurrens cultrata, antica disci manifeste remota, brachialis posterior anteriorem superans: nervus recurrens areolæ cubitali 2^{dæ}. insertus:—posticarum radius prope basin areolæ radialis a costa leniter deflexus.

Sp. 1. L. P. sticticus. Fem. *Testaceus macula verticis margine antico thoracis, metathorace abdominisque basi fuscis.* (Long. corp. 3 lin.; alar. 6½.)

Ichneumon sticticus . . . *Fabr. Suppl.*

Cryptus sticticus . . . *Fabr. Syst. Piez.* 89.

Bassus testaceus . . . *Fall. Spec. Meth. Hymenopt.*

Testaceus palpis pedibus que pallidioribus flavescentibus: mandibulæ cuspidè fuscâ: antennæ circiter 33-articulatæ, corpore paulo longiores, scapo et pedicello testaceis, articulis flagelli pubescentibus et apice longiûs pilosis, interioribus obscure testaceis

apice fuscis, exterioribus fuscis: oculi obscure virides: stemmaticum et declivitas verticis fuscae: prothorax immaculatus: mesothoracis scuti lobus medius antice fuscus: punctum fuscum supra radicem alarum: metathoracis scutum et scutellum testacea, postscutellum convexum subtiliter granulatum et lanuginosum, fuscum aut fuscocinereum: medi- et post pectus concoloria: abdominis segmentum 1^{mum}. carinulâ elevatâ postice effusâ et oblitteratâ, fuscum aut fuscocinereum apice testaceum: reliqua testacea: venter medio infuscatus: aculeus dimidii abdominis longitudine, valvulis fuscis pubescentibus, vaginâ testaceâ: ungues fusi: alæ hyalinæ stigmatè radice et squamulis stramineis, nervis partim fuscis partim pallidis.

Variat metathorace pectore et segmenti 1^{mi}. basi summâ tantum fusco-testaceis.

Variat item mesothoracis lobis humeralibus fusco maculatis.

Habitat in nemoribus femina non infrequens; *mas* adhuc invisus.

Subgen. II.—ANCYLUS.

Gen. Ancylos. Div. 2^{da}. *Hal. Ent. Mag.* Vol. I. p. 261.

Trophi fere quales subgeneri 4^{to}. (*Leiophron*). Palporum maxillarium articulus 1^{mus}. 2^{do}. non longior: caput oblatius: antennæ longiores: mesothoracis scutum sulculis ordinariis postice conniventibus impressum: abdomen ellipsoideum convexum; segmentum 1^{mum}. breve tuberculis basalibus, 2^{dum}. (e duobus conflatum) maximum lævissimum, sequentia brevia non recondita: anus incurvatus compressus integer: aculeus perbrevis incurvatus, valvulis parvis cultratis, vagina faleata: alarum anticarum stigma ovato-lanceolatum, areola disci antica fere contigua, radialis oblongo-ovata apicem alæ accedens, brachialis posterior anteriorem parum superans: nervus recurrens interstitialis.

SECTIO A.

Ungues bifidi: abdominis segmentum 1^{mum}. perbreve subquadratum.

Sp. 2. L. A. muricatus. Fem. *Abdominis medio pedibusque rufis; coxis posticis validè dentatis; ventre bifariam spinuloso.* (Long. corp. 1 $\frac{2}{3}$ lin.; alar. 3.)

Ancylos muricatus. *Hal. Ent. Mag.* Vol. I. p. 261.

Niger nitidus: antennæ circiter 31-articulatæ, corpore paulo longiores, basi nonnihil rufescentes supra obscuriûs: palpi rufescentes: abdomen antice rufum segmento 1^{mo}. dorsi nigro, postice nigrum:

segmenta ventralia apice spinulis binis instructa posticè obsoletioribus: aculei valvulæ ferrugineæ aut piceæ: pedes rufi unguibus fuscis: coxæ posticæ basi fuscomaculatæ, apice in dentem validum productæ: alæ hyalinæ stigmatate fusco, nervis dilutius, radice et squamulis obscure stramineis.

Habitat in nemoribus non infrequens: *mas* incognitus.

Sp. 3. L. A. *lituratus*. Fem. *Abdominis lateribus pedibusque rubiginosis; coxis posticis subdentatis; ventre subtilius spinuloso.* (Long. corp. 2 lin.; alar. $3\frac{3}{4}$.)

Præcedenti simillimus, major, rubedine sordidiore: abdomen longius et gracilius, lateribus rubiginosum, segmenti 2^{de}. dorso piceo: ventris spinulæ subtiliores: pedes rubiginosi; anteriorum tarsi apice posticorum coxæ basi, tibiæ apice tarsisque fuscescentes: coxæ obsoletius dentatæ.

Variat, duplo minor coxis immaculatis adhuc obsoletius dentatis.

Præcedente longe rarior.

SECTIO B.

Ungues integri: abdominis segmentum 1^{um}. longius quam latius, antice attenuatum: posteriora breviora.

Sp. 4. L. A. *excrucians*. Fem. *Pedibus flavo-ferrugineis; segmento 1^{mo}. basi sensim attenuato; ventre spinuloso.* (Long. corp. $1\frac{1}{2}$; alar. 3 lin.)

Niger nitidus: antennæ circiter 24-articulatæ, corpore parum longiores; articuli nonnulli baseos flavo ferruginei, dorso fuscis: os flavo-ferrugineum, palpi pallidiores: abdominis segmentum 1^{um}. a basi inde sensim dilatatum subtiliter aciculatum tuberculis inconspicuis: aculei valvulæ ferrugineæ: pedes flavoferruginei unguibus fuscis: coxæ posticæ inermes, basi supra fuscomaculatæ: alæ fere quales præcedentibus.

Habitat in nemoribus ubi fungi scatent: *mas* incognitus.

Sp. 5. L. A. *edentatus*. Fem. *Pedibus flavo-ferrugineis, coxis nigris; segmento 1^{mo}. basi angulato.* (Long. corp. $1\frac{1}{2}$; alar. 3 lin.)

Præcedente robustior: antennæ circiter 26-articulatæ basi subtile obscure ferrugineæ: mandibulæ flavo-ferrugineæ apice fuscae: palpi pallidiores: abdominis segmentum 1^{um}. aciculatum, latius quam præcedenti, anticè quidem attenuatum, sed tuberculis baseos

magnis prominulis apicis latitudinem fere æquantibus : aculei valvulæ piceæ : pedes flavo-ferruginei, tarsi basi demta fuscis, coxis nigris inermibus : alæ obscure hyalinæ stigmatе nervisque fuscis, radice stramineâ, squamulis piceis : areola radialis basi perpaulo latior apice attenuata, in formam semicordatam (qualis denique in *Sigalphis* Neesianis extat) e longinquo accedens.

Binis exemplaribus quæ sola mihi adsunt, jam vetustate sordidis, abdomen subdepressum est ventre complanato inermi ; sed hoc vi aut casu accidisse suspicor.

Subgen. III.—CENTISTES.

Gen. *Ancylus*. Div. 1^{ma}. *Hal. Ent. Mag.* Vol. I. p. 261.

Trophi et characteres plurimi *Ancyli*. Mesothoracis scutum absolute lævigatum : abdomen obovatum, segments 1^{mo}. longiusculo conico-attenuato tuberculis baseos inconspicuis, 2^{do}. longo, reliquis brevissimis, *mari* subdepressum, *feminæ* convexum ventre compresso : aculeus deflexus subulatus.

Sp. 5. *L. C. cuspidatus*. Mas et Fem. *Pedibus ferrugineo-flavis, posticorum tibiis apice tarsisque fusciscentibus*. (Long. corp. $1\frac{1}{2}$; alar. $2\frac{2}{3}$ lin.)

Ancylus cuspidatus. *Hal. Ent. Mag.* Vol. I. p. 261.

Fem.—Niger nitidissimus : antennæ circiter corporis longitudine, (in utroque sexu 24-articulatæ) : articuli basales subtus, clypeus et os ferrugineo-flavi, palpi pallidiores : abdominis segmentum 1^{um}. aciculatum : aculeus niger, ejusdem segmenti longitudine : pedes ferrugineo-flavi unguibus, posticorum etiam tibiis apice tarsisque fusciscentibus : alæ hyalinæ stigmatе nervisque ferrugineo-fuscis, radice et squamulis obscure stramineis : areola radialis paulo oblongior quam *L. excrucianti*.

Mas.—Antennis longioribus.

Habitat in umbrosis nemorum *mas* frequens ; *femina* nonnisi rarissime, locis fungiferis.

Subgen. IV.—LEIOPHRON.

Gen. *Leiophron*. *Nees. Act. Acad.* Tom. IX. (A. D. 1819),
Lin. 2. Genus 6.

————— *Curtis. Br. Ent.* 476.

Labrum transversum semiovale epipharynga obtegens, hujus ligulâ tantum prostante : palporum maxillarium articulus 1^{mus}. 2^{do}. parum longior : labiales 3-articulati articulis longitudine subequali-

bus : antennæ breviusculæ : caput transversum sed crassius quam præcedentibus, in formam rotundato-cubicam accedens : occiput subtiliùs marginatum : abdomen subsessile aut subpetiolatum, ovatum convexum, segmento 2^{do}. longe maximo (e duobus conflato), 3^{tio}. perbrevis, reliquis plerunque retractis : aculeus reconditus, valvulis minutissimis ovatis, vaginâ decurvâ subulatâ : alarum anticarum stigma trigonum crassum, areolam cubitalem 2^{dam}. fere aut reverâ contingens, areola radialis ab apice alæ longè remota, semilunata, stigmate non longior, antica disci perparum remota, brachiales conterminæ ; nervus recurrens interstitialis.

SECTIO A.

Segmento 1^{mo}. vix longiore quam latiore.

Sp. 7. *L. mitis. Niger antennis et pedibus ochraceis.*
(Long. corp. $1\frac{1}{2}$; alar. 3 lin.)

Niger nitidus : antennæ corpore paulo breviores parum teretes 23-articulatæ, obscure ochraceæ : os palpique concolores : mesothoracis scutum sulculis punctatis postice conniventibus, medio læve : metathorax granulatus pubescens : abdominis segmentum 1^{um}. aciculatum, tuberculis prope basin sitis, basi ipsâ constrictum : pedes ochracei, postici obscuriores, coxæ nigricantes : alæ hyalinæ nervis et stigmate dilute fuscis, radice et squamulis ochraceis. Videtur esse *femina*.^a

SECTIO B.

Segmento 1^{mo}. elongato attenuato.

(B.) a.

Mesothoracis sulculis ordinariis punctatis.

† Sp. 8. *L. orchesiæ. Curt. Br. Ent. 476. No. 1.*

Sp. 9. *L. pallipes. Mas et Fem. Niger antennis basi et pedibus ochraceis ; thoracis dorso et scutello vage punctatis pubescentibus ; petiolo obconico, striolato, tuberculis inconspicuis.* (Long. corp. $1\frac{1}{2}$; alar. $2\frac{3}{4}$ lin.)

Curt. Br. Ent. 476. No. 1.

Niger nitidus : antennæ nigro-fusæ basi ochraceæ, *feminae* 21- 23-articulatæ longitudine capitis cum thorace et petiolo ; *mari* longi-

^a I have seen but one individual of this species, which appears to have sustained some injury in the pupa, as its wings are not fully expanded. Possibly the unusual shortness of the first segment may have been produced by accident also, as in its other characters the species agrees with those of the following section.

ores et graciliores, 24- 26-articulatæ: facies albido pubescens: tempora parçè punctata et pubescentia: mesothoracis sulculi in foveam confertim punctatam ante scutellum effusi: scutum et scutellum vage punctata pubescentia: metathorax (*i. e.* postscutellum aut propodeon) reticulato-rugosus pubescens: abdominis segmentum 1^{um}. a basi tenui in apicem sensim dilatatum, absque tuberculis manifestis, subtiliter et regulariter striolatum: pedes ochracei nonnunquam ferruginei, postici sæpe brunnei: coxæ vel concolores vel posteriores nigrificantes: alæ obscure hyalinæ radice et squamulis brunneis, stigmate dilute fusco basi pallescente, areolam cubitalem secundam non contingente: areola radialis itaque sub stigmate non acuminata et magis arcuata est quam in plerisque sequentibus: nervi omnes satis distincti, dilute fusci.

Habitat in agris passim satis frequens.

Obs.—Thoracis punctura et pubescentia, petioli forma et sculptura concinna speciem prima facie optime designant: non dissimulandum tamen in copiâ exemplarium nonnulla esse obvia, staturæ minoris sed a genuinis non temere dissocianda, quæ sensim immutata characteres illos infirmant: de reliquis igitur quorum tantum unum vel alterum exemplar intueri mihi contigit, dubium oritur an discrimina inde petita satis valeant: his angustiis etsi commotus, nihilominus hic breviter commemorabo species a Cl. Curtisio jam vulgatas et pro solita benevolentia mecum communicatas.

†Sp. 10. *L. nitidus*. *Curt. Br. Ent.* 476. No. 3.

Sp. 11. *L. picipes*. Mas et Fem. *Piceus capite thorace et petiolo nigris; petiolo parum dilatato, ruguloso, obsolete tuberculato*. (Long. corp. 1 $\frac{1}{4}$; alar. 2 $\frac{1}{4}$ lin.)

Curt. Br. Ent. 476. No. 2.

L. pallipedi affinis: antennæ feminæ breviores, piceæ basi dilutius, 18-articulatæ: thoracis limbus et scutellum obsolete punctata: metathorax rugoso-reticulatus: abdominis segmentum 1^{um}. apice parum dilatatum, medio obsolete tuberculatum, longitudinaliter rugulosum rugulis confluentibus: pedes antici dilutius picei aut brunnei, posteriores picei, coxis nigris trochanteribus apice pallidis: pedes breviusculi sunt et crassiusculi; tarsi anteriores præsertim breves: alæ obscure hyalinæ stigmate piceo basi pallescente, radice et squamulis brunneis.

Sp. 12. *L. accinctus*. *Capite thorace et petiolo nigris, abdomine piceo, antennis basi et pedibus ferrugineis; petiolo fere lineari, ruguloso, tuberculis acute prominulis.* (Long. corp. $1\frac{1}{4}$; alar. $2\frac{1}{2}$ lin.)

Mas?—Antennæ 22-articulatæ graciles corpore parum breviores, fuscæ basi ferrugineæ: thoracis sulculi crenati ante scutellum conniventes: scuti intervallum impunctatum: scutellum obsolete punctatum: metathorax subtiliter rugulosus: segmentum 1^{mum}. fere lineare longitudinaliter rugulosum, tuberculis circa medium acutè prominulis, ante illa nonnihil coarctatum: alæ hyalinæ radice et squamulis stramineis, stigmate dilute brunneo basi pallido, areolam cubitalem secundam contingente: areola radialis angusta sub stigmate acuminata.

Sp. 13. *L. similis*. Fem. *Capite thorace et petiolo nigris, abdomine piceo, antennis basi et pedibus dilute ochraceis; petiolo fere lineari punctato-reticulato.* (Long. corp. 1; alar. 2 lin.)

Curt. Br. Ent. 476. No. 4.

Fem.—Antennæ 16-articulatæ, capitis cum thorace et petiolo longitudine, fuscescentes basi dilute ochraceæ: thoracis sulculi ante scutellum in foveam confertim punctulatam effusi: scuti medium et scutellum impunctata: metathorax punctato reticulatus: abdomen piceum; segmentum 1^{mum}. nigricans punctato-reticulatum, gracile apice vix paulo latius, tuberculis inconspicuis: pedes dilute ochracei: alæ obscure hyalinæ stigmate fusco-pallido, nervis tenuissimis, areola radiali perparva.

SECTIO (B.) b.

Mesothoracis sulculis lævigatis aut oblitteratis.

Sp. 14. *L. intactus*. *Piceus antennis basi et pedibus silaceis; antennis longitudine corporis.* (Long. corp. plusquam 1 lin.; alar. 2.)

Fem.?—Caput et thorax nigro-picea nitidissima, abdomen rufo-piceum: antennæ 16-articulatæ graciles filiformes, subfuscæ basi silaceæ: mesothoracis sulculi subtilissimi lævigati, postice evanescentes; metathorax nitidiusculus confertim punctatus: abdominis segmentum 1^{mum}. punctato-reticulatum, lineare basi constrictum, circa medium tuberculatum: pedes silacei: alæ obscure hyalinæ stigmate dilute ochraceo, radice et squamulis piceo-stramineis.

Sp. 15. *L. fulvipes*. Mas et Fem. *Piceus antennis basi et pedibus dilute ochraceis; antennis perbrevibus*. (Long. corp. vix 1 lin.; alar. $1\frac{1}{4}$.)

Curt. Br. Ent. 476. No. 5.

Caput et thorax nigro-picea nitidissima, abdomen rufo-piceum: antennæ 16-articulatæ dilute ochraceæ apice fuscescentes; *feminæ* crassiusculæ longitudine capitis cum thorace, *mari* paulo longiores et graciliores: mesothoracis scutum lævigatum: metathorax punctato-reticulatus: abdominis segmentum 1^{um}. punctato-reticulatum, paulo brevius quam proxime affinibus, basi constrictum, ante medium tuberculatum, apice perparum dilatatum: pedes breviusculi dilute ochracei: alæ obscure hyalinæ stigmate dilute brunneo basi pallido, nonnunquam pallide ochraceo, radice et squamulis piceo-stramineis.

Habitat circa sepes herbidos satis frequens.

Sp. 16. *L. pallidistigma*. Fem. *Piceus antennis pedibus et alarum stigmate silaceis*. (Long. corp. 1; alar. 2 lin.)

Curt. Br. Ent. 476. No. 6.

Differt a præcedente statura procera, pedibus et petiolo longioribus et gracilioribus: antennæ 16-articulatæ capite cum thorace parum longiores, totæ silaceæ: abdominis segmentum 1^{um}. punctato-reticulatum, lineare basi nonnihil constrictum, medio tuberculatum: alæ hyalinæ stigmate silaceo aut stramineo, radice et squamulis stramineis.

Habitat cum præcedente rarius.

†Sp. 17. *L. basalis*. *Curt. Br. Ent.* 476. No. 6^a.

Sp. 18. *L. apicalis*. Mas et Fem. *Flavotestaceus abdomine postice nigricante, feminæ metathoracæ concolore*. (Long. corp. $1\frac{1}{4}$; alar. 2 lin.)

Curt. Br. Ent. 476. No. 7. et Fig.

Diaphane flavotestaceus: oculi virides: ocelli fusi: antennæ pallidiores apice summo fuscescentes, graciles filiformes, longitudine capitis cum thorace et petiolo, 16 aut 17-articulatæ articulo 3^{tio}. prælongo: mesothoracis scutum lævissimum: punctum fuscum supra radicem alarum: metathorax punctato-reticulatus in *feminâ* nigricans: abdominis segmentum 1^{um}. elongatum gracillimum planè lineare, ante medium tuberculatum, punctatum: segmentum 2^{dum}. basi pallide flavotestaceum, dehinc ut sequentia,

nigrum : pedes graciles pallidiores : alæ hyalinæ stigmatè pallido apice fusco-tincto : areola radialis perbrevis ; cubitalis interior et antica disci apice effusæ.

ADDENDA ET CORRIGENDA.

Vol. I. p. 273. Stirps III. Dryini.

Huc referendum Genus *Embolemus* (Westwood, *Philos. Mag.* 3d Ser. Vol. II. p. 444), thorace, abdomine, alis et antemarum articularum numero cæteris congruens : etsi caput globosum, frontis tuberculum cui antennæ insident solito superiùs et harum eximia proceritas faciem alienam imprimunt, et cum Stirpe quinta connexionem quamvis e longinquo pulcherrimè exhibent.—^{Duus.} Westwood loco laudato alarum nervos ad typum *Alysiidarum* retulit ; sed hæc observatio nonnisi caute accipienda est : namque ala *Embolemini* typum *Dryinorum* reliquorum sequitur ab *Evaniis* parum discrepantem ; nec inter *Ichneumones* talem obviam esse credo, quorum nervi costalis et subcostalis semper intimè connexi familiæ characterem constantissimum præbent.

Vol. I. p. 274. Gen. XVIII. *Cinetus*.

Bina Genera hic esse confusa seriùs cognovi, viz.

XVIII. *Cinetus* : antennæ fractæ scapo elongato, *mari* 14-articulatæ articulo 3^{to}. sinuato, *feminæ* 15-articulatæ : frons producta : mesothoracis scutum bisulcum. *Sp. C. gracilipes. Curt. Br. Ent.*

XVIII^a. *Ismarus* : antennæ scapo parum elongato, articulo tertio recto : *mari* 15-articulatæ, *feminæ* 14-articulatæ : frons lata æquata : mesothoracis scutum lævigatum. *Sp. Cinetus dorsiger Curt. B. E.*

Vol. II. p. 230. *Mirax rufilabris*.

Exemplaribus vivis collatis jam plura corrigenda esse videntur, et nomen triviale immutandum ; legas itaque.

Sp. M. *Spartii*.

Caput rufo-castaneum albido-pubescent vertice medio nigricante : oculi virides : antennæ nigro-fusæ pedicello ferruginoso : thorax niger : mesothorax lævis sericeus subtilissime albido pubescens : metathorax lævissimus nitidus : abdomen nigrum nitidum segmentis 2 anterioribus pallide flavis : pedes ferruginei : alæ fusco-hyalinæ, basi flavescences, stigmatè fusco apice summo decolore,

nervis dilute fuscis, squamulis fusco-ferrugineis. (Long. corp. 1 lin.; alar. $2\frac{1}{2}$.) Caput thoracis, &c.—(ut antea, descriptionis ulterioris his emendatis,)—Oculi pilis raris subtilissimis erectis consiti: abdomen thoracis fere longitudine et latitudine, ovato-orbiculatum subdepressum læve: segmenta dorsi octo, anteriora longitudine subæqualia, posteriora lineari-transversa: primi scutum gracillimum (adhuc gracilius quam *Microgastri laterali*), apice attenuatum, latera membranacea late resecta: sextum ventrale leviter carinatum et apice productum, aculeum subexertum fulciens.

Habitat in Spartis scopario.

Vol. II. p. 252. Sp. 45. Micr. intricatus.^b Vespa, &c.
Ray Ins. 255. 13.

ART. XLIII.—*Characters of some undescribed New Holland Diptera.* By FRANCIS WALKER.

MEGISTOCERA.—*Wiedemann.*

M. dispar. Mas et Fem. *Mari antennæ longissimæ, fem. brevissimæ.* Propter femina antennarum brevissimas *Magistocera* non benè convenit, at vix genus diversum.

Mas.—Ferruginea, pubescens: oculi nigro-fusci: palpi nigri: antennæ fuscæ, pubescentes, corpore ferè quadruplo longiores; articuli 1^{us}. et 2^{us}. omninò 3^{us}. que basi ferruginei: thorax subtus pallidior: mesothorax vittis supra 3 pallidis: abdomen utrinque fusco fasciatum, apice obscurius: pedes ferruginei, longi, graciles, pubescentes, femora et tibiæ apice tarsique nisi ad basin fusca: alæ hyalinæ, iridescentes, basi et ad costam fusco-flavæ; squamulæ et nervi flava, hi ad apices plerumque fusci: halteres flavi, apice pallidè fusci.

Fem.—*Mari* similis at obscurior, thorax angustior, abdomen longius, pedes breviores, alæ paullò breviores et angustiores: antennæ obscurè fuscæ, capite breviores; articuli 1^{us}. et 2^{us}. ferruginei:

^b In the course of last autumn, Mr. Curtis and I found the follicles of this species in profusion, attached to springs of heath, grass, &c. in the Western Isles. The caterpillars of *Mamestra Pisi* were wandering about the same places, and to them probably the "*Eruca viridis lineolis albicantibus*" of Ray should be referred. Two species of *Hemiteles*, and one of *Pezomachus*, were produced in abundance out of these follicles, along with the *Microgaster*.

thorax anticè abdominisque segmentorum suturæ fusca : alæ subhyalinae, basi et ad costam obscurè fuscae. (Corp. long. $4\frac{1}{2}$ —5 lin. ; alar. 12—13 lin.)

TIPULA.—*Linné.*

T. ramicornis. Mas et Fem. *Ad formam non hactenus decretam pertinens, Europæ Tipulis antennis pectinatis et alarum nervis aliter ad apices collocatis discrepans.*

Mas.—Ferruginea, lævis, ferè glabra : oculi nigro-fusci : os utrinque et subtus fuscum : palpi nigro-fusci : antennæ flavæ, thorace et capite paullò longiores, apice fuscae, ramulis ornatae intus 7 extus 14 nigris sat longis : mesothorax anticè fuscus et ferrugineo bivittatus, utrinque fusco maculatus : abdomen supra et subtus nigro vittatum ; segmenta basale et apicale omninò ferruginea : pedes ferruginei, longi, graciles, pubescentes ; femora apice nigra ; tibiæ obscurè ferrugineae, apice fuscae ; tarsi fusci : alæ hyalinae, basi et ad costam fuscae maculis 4 parvis subrotundis hyalinis ; margo posticus griseus ; nervi discoidales fusco limbatì : halteres ferruginei, apice pallidè fusci.

Fem.—*Mari* similis ; abdomen longius ; antennæ breviores, ramulis intus 7 extus 8 ornatae brevissimis : abdomen apice et oviductus rufa. (Corp. long. 8—11 lin. ; alar. 14—17 lin.)

LIMNOBIA.—*Meigen.*

L. vicaria. Fem. *Limnobiæ geniculatae simillima, at pedibus omninò pallidis.*

Fusca, obscura : caput fulvo-fuscum, angustum : oculi obscurè fusci : antennæ fuscae, capite paullò longiores : thorax subtus et posticè fulvus : abdomen obscurè fuscum, longum, gracile : oviductus rufus, nitidus : pedes pallidè fulvi, longi, graciles ; femora ferè omnia tibiæ que basi et apice pallidè fusca ; tarsi apice et ungues nigri : alæ subhyalinae, iridescentes ; costa fusca, basi pallidior, maculis plurimis subhyalinis ; sub costam maculae 4 majores subfuscae ; squamulae et nervi fusca ; nervi omnes longitudinales punctis fuscis ornati ; nervulus transversus discoidalis fusco limbatus ; halteres pallidè fulvi, apice fusci. (Corp. long. 7 lin. ; alar. 10 lin.)

CTENOPHORA.—*Meigen.*

C. vilis. Mas. *Europæ Ctenophoris abdomine plano, alienaque ad alarum apices nervorum structura discrepans.*

Fusca, obscura : oculi nigri : palpi fusci, basi ferruginei : antennæ fuscae, basi ferrugineae, capite thoraceque paullò longiores, intus

ramulis 15 sat longis ornatae: thorax supra griseo bivittatus, subtus pallidior: abdomen obscurè fuscum, planum, sublineare, apice latius; segmentorum suturae maculae quae laterales ferrugineae: pedes ferruginei, pubescentes; femora apice nigra; genua ferruginea; tibiae fuscae; tarsi fusci, apice nigri: alae subfuscae, maculis duabus costalibus fuscis, una costae medio parva subrotunda, altera ad apicem propior major in discum producta; squamulae et nervi fusca: halteres flavi, apice nigri. (Corp. long. 5 lin.; alar. $9\frac{1}{2}$ lin.)

C. bella. Fem. *Præcedentis structura.*

Atra, obscura: antennae thorace paulò breviores, ramulis plurimis brevissimis ornatae: mesothorax supra vittis 3 griseo-fulvis, utrinque macula magna concolore: abdomen aureum, basi angustius, apice acuminatum; segmentum 1^{um}. nigrum; 5^{um}. apice nigrum; 6^{um}. et 7^{um}. nigra, basi aurea: oviductus rufus: pedes nigri, pubescentes; femora aurea, apice nigra; tibiae aureo fasciatae: alae subflavae, basi flavae, maculis plurimis nigris vittas 3 irregulares quarum basalem et mediam connexas fingentibus; discus hyalinus; margo posticus et apex grisei; squamulae nigrae; nervi fusci, basi et nonnulli omninò flavi: halteres nigri. (Corp. long. 5 lin.; alar. 9 lin.)

BIBIO.—*Geoffroy.*

B. imitator. Mas et Fem. *Niger* (mas) aut *rufus* (fem.), *pedibus nigris, alis fusciscentibus.* Obs. B. hortulano *simillimus sed halteres pallidi fem. quae corpus omninò rufum.*

Mas.—Niger, nitidus, pilis fulvis hirtus: caput thoracis latitudine: oculi rufi, maximi, supra connexi: ocelli approximati: antennae capite breviores: abdomen sublineare, parùm nitens: pedes nigri, pubescentes; pulvilli pallidi: alae subfuscae, iridescentes; costa fusca, basi fulva, macula anteapicalis obscurior; squamulae, nervi et halteres fulva.

Fem.—Rufus, nitidus, laevis, immaculatus, lanugine fulva vestitus: caput parvum angustum: oculi, ocelli, os et antennae nigra: abdomen parùm nitens, apice angustius: pedes nigri, nitidi, lanugine nigra vestiti; coxae et genua rufa; tarsi basi rufi; pulvilli pallidi: alae fuscae; costa obscurior, basi fulva; nervi fusci, basi fulvi; squamulae et halteres fulva. (Corp. long. 3— $3\frac{1}{2}$ lin.; alar. 5—7 lin.)

PSILOPUS.—Meigen.

P. cingulipes. Mas. *Cyaneo-viridis, pedibus nigris fulvo cinctis, alis griseo-hyalinis.*

Viridis, nitens, pilis supra sparsis nigris subtus albis hirtus: caput cyaneo-viride, prope os cyaneum et argenteo micans: oculi rufi: antennæ nigræ; articuli 1^o. ad 3^{um}. brevissimi; 4^{us}. gracillimus, capite duplo longior: thorax subtus argentens; mesothorax posticè cyaneus: abdomen cylindricum, thorace ferè triplo longius, apice angustum; segmenta basi apiceque ænea: sexualia fulva: pedes nigri lanugine nigra vestiti, basi pilis albis hirti; coxæ argenteo micantes; femora apice, protibiæ et mesotibiæ fulva; metatibiæ obscurè fuscæ, basi fulvæ: alæ griseo-hyalinæ, iridescentes; squamulæ et nervi fusca; nervi transversi valdè arcuati; halteres fulvi, apice fusci. (Corp. long. $3\frac{3}{4}$ lin.; alar. $6\frac{1}{2}$ lin.)

P. tricolor. Mas. *Cyaneus, abdomine viridi apice cupreo-æneo, pedibus nigris, alis griseo-hyalinis.*

Cyaneus, nitens, brevis, latus, pilis nigris sparsis hirtus: caput viridi-cyaneum: os nigrum: oculi rufi: antennæ nigræ; articuli 1^o. ad 3^{um}. brevissimi; 4^{us}. gracillimus, capite duplo longior: abdomen viride, apice cupreo-æneum, subtus pilis albis hirtum: sexualia nigra: pedes nigri; coxæ et femora viridia: alæ griseo-hyalinæ, iridescentes; squamulæ et nervi fusca; nervus transversus basalis rectus, apicalis valdè arcuatus: halteres nigri. (Corp. long. $2\frac{1}{2}$ lin.; alar. $4\frac{1}{4}$ lin.)

P. connexus. Fem. *Cyaneo-viridis, pedibus flavis, alis hyalinis fusco bifasciatis.*

Viridis, nitens, pilis nigris sparsis hirtus: caput argenteum, supra cyaneum: os flavum: oculi rufi: antennæ nigræ; articuli 1^o. ad 3^{um}. breves; 4^{us}. gracillimus, capite ferè duplo longior: thorax viridi-cyaneus, subtus albo pubescens, utrinque æneo maculatus: abdomen basi et apice cyaneo-viride; segmenta basi et apice cuprea: pedes flavi, setis nonnullis nigris armati; coxæ nigræ; meso- et metatarsi nigri, illi basi fusci; protarsi obscurè fuscii, basi fulvi: alæ hyalinæ, iridescentes, ad costam fulvescentes, fasciis duabus latis anticè connexis posticè abbreviatis fuscis; squamulæ fulvæ; nervi fuscii; nervus transversus basalis ferè rectus, apicalis valdè arcuatus: halteres flavi. (Corp. long. $2\frac{1}{2}$ lin.; alar. $4\frac{1}{4}$ lin.)

THEREVA.—*Latreille.*

T. misella. Mas. *Argenteo-fusca, abdomine subtus antennis pedibusque fulvis, alis subhyalinis.*

Obscurè fusca, pilosa: oculi nigro-rufi: ocelli nigri: os fulvum, capitis longitudine: antennæ fulvæ, apice fusæ: abdomen argenteo micans, apice et subtus fulvum; segmenta apice flava: pedes fulvi; tibiæ spinis nonnullis brevissimis nigris armatæ; tarsi apice obscuriores: alæ subhyalinæ, iridescentes, ad costam fulvescentes; squamulæ fulvæ; nervi fuscii; nervi transversii fusco sublimbati: halteres fulvi. (Corp. long. $2\frac{1}{2}$ lin.; alar. $4\frac{1}{2}$ lin.)

BRACHYOPA.—*Hoffmansegg.*

B. rufo-cyanea. Mas. *Rufo-cyanea, antennis fulvis, pedibus rufo-fuscis, alis fulvescentibus.*

Nitens, pilosa: caput et thorax rufa, minimè cyanescentia, illum ad antennarum insertionem supra fulvum: antennæ fulvæ; articulus 4^{us}. obscurior: os rufum: oculi nigro-ænei: thoracis discus supra æneo-fuscus: abdomen rufo-cyaneum, subtus cyaneum, lanugine medio utrinque et apice omninò pallida vestitum: pedes obscurè rufi, pilosi; femora supra et metapedum femora tibiæ que omninò fusca; ungues nigri; pulvilli pallidè rufi: alæ subfulvescentes, iridescentes, ad costam fulvæ; squamulæ nigro-fusæ; nervi fuscii, basi fulvi; squamæ sordidè albidæ: halteres obscurè fuscii. (Corp. long. 5 lin.; alar. 10 lin.)

HELOPHILUS.—*Meigen.*

H. griseus. Fem. *Niger, antennis rufis, abdomine subtus fusco, alis griseis.*

Niger, subtilissimè punctatus, parùm nitens, lanugine cana tectus: hypostoma fulvum: antennæ rufæ; articulus 4^{us}. niger: oculi nigro-fuscii: scutellum ferè glabrum: abdomen subtus fuscum; segmenta basi utrinque albo pilosa: pedes nigri, subtilissimè punctati, pilis nigris et griseis vestiti; tarsi subtus lanugine rufa tecti; pulvilli fulvi: alæ griseæ, iridescentes, ad costam fusco inter nervos secundarium et auxiliarem maculatæ; squamulæ et nervi nigro-fusci; squamæ sordidè albæ: halteres rufi, apice fuscii. (Corp. long. 4 lin.; alar. 7 lin.)

ANTHRAX.—*Fabricius.*

A. extensa. Mas. *A. præargentatæ aspectu, obscure fusca, pedibus alisque concoloribus.*

Obscurè fusca, pubescens, subtus fulva : caput posticè albidum, pilis supra nigris anticè fulvis hirtum : oculi rufo-ænei : os et antennæ nigra : thoracis abdominisque latera pilis fulvis hirta, hoc quoque apicem versus et ille utrinque ante alas-pilis nigris hirta : pedes nigro-fusci, pubescentes ; tarsi nigri : alæ longæ, angustæ, obscurè fuscæ, posticè et apice dilutiores, anticè et basi ferrugineæ ; squamulæ nigrae ; nervi ferruginei, nonnulli nigri : halteres fulvi, ante apices fusco cingulati. (Corp. long. $5\frac{1}{2}$ lin. ; alar. $13\frac{1}{2}$ lin.)

ART. XLIV.—*Transactions of the Entomological Society of London. Vol. I. Part I. Seven Plates, Sixty-six Pages, and an Appendix.* London: Longman and Co. 1834.

THE first number of the Transactions of this thriving Society has at length appeared, and contains papers by Messrs. Spence, W. B. Spence, Hope, Lewis, Waterhouse, Westwood, W. Christy jun., G. R. Gray, Shuckard, and Saunders: the whole of these are valuable papers, and we think the Publishing Committee have exercised great judgment in the selection. Mr. Spence's paper is one of considerable interest,—we have already given an outline of it,—but those by Messrs. Shuckard and Waterhouse are of high entomological importance; we should be proud to have them in our own pages.

We rather regret that the Society has thought it necessary to preface these Transactions with an attack upon ourselves, indicative throughout of hostility. We do not pretend that we were unacquainted with the existence of this feeling towards us, but *we* had no hostile feeling, and we determined not to see it in others. We hoped that our labours in behalf of the Society would compel our enemies, in common decency, to treat us with *ostensible* good will; and now, even now, we will not abandon a society because at present governed by our foes,—it may be governed by our friends,—and the majority, nine out of every ten, disapprove of this attack. This introductory portion of the work is divided into two parts; the principal object of the first part is to combat Mr. Swainson's masterly and unanswer-

able letter, at p. 190 of this Magazine,^a on the subject of publishing transactions; the object of the second is —; we will give it entire.

“ It was not till some time after the foregoing introduction was written, that the ninth number of the Entomological Magazine came into our hands. We trust our readers will believe, from their general tenor, that no unkindly spirit dictated one line of the preceding pages; and we preface our further observations, unwillingly extorted by the work just alluded to, by the declaration, that no such feelings actuate us even now. We do feel, however, that we should be liable to the imputation of an abandonment of our duty^b, if we were to suffer some remarks and unfounded assertions, contained in the number of the Entomological Magazine for October, 1834, to pass unnoticed.

“ We shall make no comment on the sweeping observation, at page 332, that all our entomologists, with only four exceptions, are fools; but content ourselves with thanking the Editors, in the name of the rest, for the compliment.^c The assertion, however, in the next paragraph, that the Society is going down, requires severer animadversion. This, it seems, is made on the circumstance, that the meeting in September was attended by only twelve members; and it is repeated at page 434, in the following paragraph:—‘ The attendance of members at these sittings has greatly decreased; at the July sitting about twenty members were present; at the August sitting about fifteen; at the September sitting about twelve.’ Now, whatever the Editors of this Journal may please to insinuate, these attendances, considering the time of year, cannot be called bad; and as to their having greatly decreased since the opening, it would have been very extraordinary if they had not, when a large proportion of the members had left London, as always happens in the summer months. But look at the meetings of other societies at the same period,—the Zoological, for instance; the number of members of that body who attended the scientific meetings in September, did not amount, on either occasion, to twelve^d, although the portion of members in the two Societies is nearly twenty-five to one. Is the Zoological Society also ‘ going down?’

^a The Entomological Magazine being the “ ELSEWHERE ” alluded to.

^b The “ DUTY ” of a society to attack a detached paper, published in a private undertaking.

^c The passage is this: — “ Ambulator, Hanson, Bird, and one other, are the only entomologists to whom I feel bound by any ties of *kindred feeling, affection, or gratitude.*”

^d Nor, we believe, does it in what is called the season.

"We have already stated that the Council considered it essential to the credit of the Society, that it should publish its own Transactions, and have given the reasons for their coming to that resolution. If any doubt could have been entertained of their wisdom in so doing, as far as the character of the Transactions might be affected by *association*, it is effectually removed by the conduct of the editors of the Entomological Magazine themselves, in having admitted that farrago of nonsense, which, under the title of *Colloquia Entomologica*, stands as the head of their present number. So miserable an attempt at wit, and so ridiculous a parade of learning, throws even Isla's *Domine* himself into the back ground. 'Lord! Lord! it was a very Gabilon (Babylon). More than one full hour were we at it, hand to hand; and to every word I said, he produced, directly, such heaps of proofs and quotations, *all in Latin*, that it seemed for all the world as if he carried them in the breast-pocket of his large cloak.'^e Why do they not practise the motto they adopted—*γνῶθι σεαυτὸν*?

"The following passage occurs at page 333 of the *Colloquia* :—

"'ENT. I am firmly persuaded, from what I see of the working members of its Council, that the Entomological Society will retard, not advance, entomology.'

"Very civil! However, *spectemur agendo*!

"As to the hope (p. 332) that 'the Entomological Society would have been the means of uniting entomologists into one body, and called forth kindlier feelings among us,' we are not conscious of its having failed in that desirable object, nor do we know of any unkindly feeling connected with the Society, except those too palpably entertained by the conductors of the Entomological Magazine.

"And why do they entertain them? We leave them to answer that question as they may, and shall merely state the fact, *that their wish to publish the Memoirs read before the Entomological Society, in their own journal, was not acceded to by the Council*†.

"We have now ended our unpleasant task, and shall not think it necessary to bestow any further notice on the Entomological Magazine,—whether it flatter or abuse, praise or condemn us."

Is it dignified of a society to sit in committee and solemnly concoct an attack like this on a private undertaking? Admitting that the facts are sound, and the conclusions logical;

^e This quotation stands as a foot note in the Transactions.

† Neither was it ever entertained by the editor of this Magazine. To oblige the Society, we offered to publish gratuitously a few of its early papers, knowing it could not afford a journal of its own.

admitting this, even in the face of our foot notes; yet still is it dignified? Will it benefit the Society? The first number of the Transactions comes to us, not as a simple collection of memoirs, but as a review. Of the justice or injustice of the review let our readers judge; that is not a point on which an interested party like ourselves ought to decide.

Two words on the Colloquia Entomologica: *first*, a magazine is only responsible for opinions conveyed in articles avowedly editorial; *second*, the Colloquia Entomologica are neither really nor avowedly editorial, on the contrary, editorial remarks on them have frequently occurred.

ART. XLV.—*Monographia Chalciditum*. By FRANCIS WALKER.

(Continued from p. 369.)

“ ——— the green myriads in the peopled grass.”^a

§§ *Clava elongata, acuminata.*

Femora	{ -gracilia	PTEROMALUS.
	{ -valida	CHEIROPACHUS.

GENUS XIII.—PTEROMALUS,^a *Swederus*.

Corpus pilis sparsis hirtum: thorax posticè utrinque pilis albis hirtus: abdomen apice densè hirtum; segmenta ferè recta, 1^{um}. magnum, sequentia minora: oviductus rufus, abdomine occultum aut ejus apicem vix transiens; vaginæ nigræ, pubescentes: femora gracilia, non dilatata; *fem.* mesofemora subtus apices versus setigera.^b

The species are very numerous, and the forms of the antennæ and abdomens of the females are almost as various as the species, but correspondent variations are not so apparent in the males.

SECTIO I.—Mas et Fem.

Corpus angustum, sublineare, quasi squameum: caput mediocre, *mas* thorace paulò latius, *fem.* thoracis latitudine: mandibulæ

^a Πτερόν ala, μάλός tener.

^b The other characters of the genus are detailed under the sections.

subquadratae, dentibus minutis armatae 4; una extus recta, intus arcuata, dentes ferè obtusi; altera subarcuata, dentes paullò longiores et acutiores: maxillae longae, subarcuatae; apices s. laciniae angustae, acuminatae, lobatae; palpi 4-articulati, graciles, ferè filiformes; articuli 1^{us}. 2^{us}. et 3^{us}. mediocres, aequales, cyathiformes; 4^{us}. elongato-fusiformis, apice pilosus, 3^o. plus duplò longior: labium perangustum, lineare, posticè conoideum; ligula parva, brevis, anticè ciliata; palpi 3-articulati, breves, crassi, articulus 2^{us}. brevissimus, 3^{us}. acuminatus: antennae graciles, subclavatae, *mari* corporis dimidio vix longiores, *fem.* paullò breviores et crassiores; articuli 5^o. ad 10^{um}. mediocres, sublineares, gradatim breviores, vix latiores; clava elongato-ovata, vix acuminata, articulo 10^o. plus duplò longior et paullò latior: thorax ovatus, minimè convexus: prothorax brevis: mesothoracis scutum, scutellum, paraptera et epimera magna; parapsidum suturae vix conspicuae: metathorax mediocris: abdomen subtilissimè squameum, ferè laeve, quasi excavatum, non compressum nec angulatum, subtus vix carinatum, *mari* sublineare basi angustius thoracis longitudine, *fem.* elongato-ovatum apice acuminatum thorace paullò longius; segmentum 1^{um}. magnum; sequentia breviora, subaequalia: oviductus abdominis apicem vix transiens: pedes seorsum graciles: alae angustae; nervus humeralis ulnari multò longior, ramulum rejiciens nullum; cubitalis radiali vix longior; stigma ramulum brevem emittens.

Sp. 1. Pter. cavus. Mas et Fem. *Viridi-æneus*, *mari antennis fulvis abdominis macula pedibusque flavis*, *fem. antennis nigris pedibus fuscis, alis albis*.

Mas.—Obscurè viridis: oculi ocellique rufo-fusci: os fuscum: antennae pallidè fulvae; articuli 2^{us}. 3^{us}. et 4^{us}. supra fusci: scutellum viridi-æneum: abdomen cupreo-æneum, basi viride, medium ante flavo maculatum; sexualia flava: pedes flavi; coxae æneo-virides; tarsi apice, ungues et pulvilli fusci: alae hyalinæ, albæ; squamulae fuscae; nervi pallidè flavi; stigma minutum.

Fem.—Æneo-viridis: antennae nigrae; articulus 1^{us}. basi fuscus: thorax subtus cyaneo-viridis: abdomen cupreo-æneum, basi apiceque viridans: pedes fusci: coxae cyaneo-virides; femora obscurè fusca; tibiae apice, necnon meso- et metatarsi basi fulva: alarum nervi pallidè fulvi. (Corp. long. $\frac{3}{4}$ —1 $\frac{1}{2}$ lin.; alar. 1—1 $\frac{3}{4}$ lin.)

Var. β.—*Mas*, antennae articulis 2^o. ad 4^{um}. vix fuscis.

Var. γ.—*Mas*, caput et thorax æneo-viridia.

Var. δ.—*Fem.* femora et metatibiae nigro-fusca.

Var. ε.—*Fem.* caput et metathorax viridia.

Var. ζ.—*Fem.* antennæ omninò nigræ: mesothorax æneus: femora et tibiæ nigro-fusca: genua et tarsi obscurè fusca: alæ ad costam fulvescentes; nervus humeralis apice et stigma pallidè fusca.

Var. η.—*Fem.* antennæ articulo 1^o. basi fulvo: alarum nervi flavi.

Var. θ.—*Fem.* antennæ omninò nigræ: propedum tibiæ apice, basi et subtus fulvæ; tarsi basi fulvi.

Reared from pupæ of *Pontia Brassicæ* in the month of May, by Mr. Davis. June and July; on grass beneath trees, and on decayed wood; near London. June; South of France.

Sp. 2. *Pter. decedens.* Mas et Fem. *P. cavo similis*, mari *abdomen immaculatum*; fem. *antennæ crassiores.*

Mas.—Obscurè viridis: oculi ocellique rufo-fusci: antennæ fuscae: scutellum viridi-æneum: abdomen cupreo-æneum, basi viride: sexualia flava: pedes fusci; coxæ virides; genua et tibiæ apice flava; meso- et metatarsi flavi, apice fusci; profemora apice et protibiæ flava, hæ fusco fasciatæ: alæ hyaline, albæ; squamulæ fuscae; nervi pallidè flavi; stigma minutum.

Fem.—Æneo-viridis, parùm nitens: antennæ nigro-fuscae; articulus 1^{us}. fulvus, apice fuscus: abdomen cupreo-æneum; segmenta basi viridi-ænea: pedes fusci; coxæ virides; femora et tibiæ apice fulva; tarsi fulvi, basi flavi, apice fusci: alarum nervi pallidè fulvi. (Corp. long. $\frac{2}{3}$ — $1\frac{1}{2}$ lin.; alar. $\frac{3}{4}$ — $1\frac{1}{2}$ lin.)

Var. β.—*Mas*, meso- et metatarsi fusci, basi flavi.

Var. γ.—*Mas*, antennæ fulvæ; articuli 2^{us}. et 5^{us}. supra fusci: scutellum viride: pedes flavi; coxæ virides; femora supra fusco vittata; tarsi apice pallidè fusci.

Var. δ.—*Mas*, antennæ omninò fulvæ: caput et thorax æneo-viridia.

Var. ε.—*Mas*, *Var. γ.* similis: antennæ fulvæ; articuli 1^{us}. apice 2^{us}. que supra fusci: scutellum æneo-viride.

Var. ζ.—*Mas*, *Var. ε.* similis: antennæ flavæ, articulo 2^o. clavaque supra pallidè fusci.

Var. η.—*Fem.* abdomen viridi-æneum, basi apice que viridans.

Var. θ.—*Fem.* protibiæ omninò fulvæ.

Var. ι.—*Fem.* caput viride: alarum nervi flavi.

Var. κ.—*Fem.* proalæ ad costam fulvescentes.

Var. λ.—*Fem.* antennæ articulo 1^o. fusco, basi fulvo.

May to September; on grass beneath trees; near London. September; Isle of Wight.

Sp. 3. Pter. perversus. Fem. *Viridi-æneus, antennis fulvis, basi pedibusque fuscis, alis albis.*

Æneo-viridis, parùm nitens : antennæ fulvæ, gracillimæ ; articuli 1^{us}. et 2^{us}. obscurè fusci : scutellum æneum : abdomen cupreo-æneum, basi viridans : pedes obscurè fusci ; coxæ æneo-virides ; genua et tarsi fulva, hi apice fusci : alæ hyalinæ, albæ ; squamulæ fuscae ; nervi pallidè flavi ; stigma minutum. (Corp. long. $\frac{2}{3}$ lin. ; alar. $\frac{3}{4}$ lin.)

August ; on grass beneath trees ; near London.

SECTIO II.—Fem.

Corpus breve, latum, quasi squameum : caput magnum, thorace vix latius : mandibulæ subquadratæ, ferè rectæ, similes, intus paullò arcuatæ ; dentes sat magni, obtusi, subæquales : maxillæ longæ, subarcuatæ ; lacinia angustæ, acuminatæ, lobatæ ; palpi 4-articulati, graciles, filiformes ; articulus 1^{us}. mediocris ; 2^{us}. paullò longior ; 3^{us}. 1ⁱ. longitudine ; 4^{us}. elongato-fusiformis, acuminatus, apice pilosus, 3^o. plus duplò longior : labium ovatum, posticè conoideum ; ligula parva, brevis, antice ciliata subtus transversè lineata ; palpi 3-articulati, breves, crassi ; articulus 2^{us}. brevissimus ; 3^{us}. acuminatus : antennæ validæ, clavatæ, corporis dimidiò plus minusve longiores ; articuli 5^o. ad 10^{um}. breves, lati, valde approximati, longitudine decrescentes ; clava ovata, compacta, acuminata, articulo 10^o. duplò longior et paullò latior : thorax ovatus, convexus : prothorax brevissimus : mesothorax maximus ; parapsidum suturæ vix conspicuæ : metathorax parvus : abdomen rotundum, planum, subtilissimè squameum, ferè læve, subtus convexum, thorace brevius ; segmentum 1^{um}. magnum ; sequentia breviora, subæqualia : oviductus abdominis apicem non transiens : alæ plerumque latæ ; nervus humeralis ulnari multò longior, ramulum rejiciens nullum ; cubitalis radiali non longior ; stigma ramulum brevissimum emittens.

Sp. 4. Pter. patulus. Fem. *Viridi-æneus, antennis nigris, pedibus rufis, alis limpidis.*

Æneus, parùm nitens : caput æneo-viride : oculi ocellique obscurè fusci : mandibulæ rufæ : maxillæ et labium nigro-viridia : lacinia flavæ : ligula albida : palpi fusci : antennæ nigrae ; articulus 1^{us}. lætè fulvus : thorax utrinque et subtus viridi-æneus : metathorax viridis : abdomen cupreo-æneum, basi lætè æneo-viride fulvescens : pedes rufi ; coxæ virides ; genua et tarsi flava, hi

apice fusci: alæ limpidæ; squamulæ pallidè fuscæ; nervi flavi; stigma minutum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. $1\frac{3}{4}$ —2 lin.)

August and September; on windows near London; North Devonshire; Isle of Wight, &c.

Sp. 5. Pter. extentus. Fem. P. patulo *similis*; *minor*; *antennæ graciliores, nigro-fuscæ*; *alæ subfulvescentes*.

Æneus: caput æneo-viride: oculi ocellique obscurè fusci: antennæ nigro-fuscæ; articulus 1^{us}. rufus; 2^{us}. et 3^{us}. fusci; thorax subтус et utrinque æneo-viridis; scutellum cupreo-æneum: abdomen cupreo-æneum, basi lætè æneo-viride: pedes pallidè rufi; coxæ virides; ungues et pulvilli fusci: alæ hyalinæ, albæ, sub costam fulvescentes; squamulæ fulvæ; nervi flavi; stigma minimum. (Corp. long. 1 lin.; alar. $1\frac{1}{2}$ lin.)

June; New Forest, Hampshire.

Sp. 6. Pter. amplus. Fem. P. patuli *statura*; *antennæ graciliores*; *femora nigro-fusca*; *alæ albæ*.

Æneo-viridis, parùm nitens: caput viride: antennæ nigræ; articulus 1^{us}. rufus; 2^{us}. viridis, apice fulvus: abdomen cupreo-æneum, basi lætè viridi-æneum: pedes fulvi; coxæ virides; femora nigro-fusca; genua et tarsi flava, hi-apice fusci: alæ hyalinæ, albæ; squamulæ et nervi pallidè fusca; nervus humeralis fulvus; stigma minutum. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{3}{4}$ lin.)

June; Isle of Wight.

Sp. 7. Pter. catillus. Fem. P. patulo *paullò minor et angustior*; *antennæ graciliores*; *femora nigro-fusca*; *alæ subfulvæ*.

Æneus, parùm nitens: caput viridi-æneum: oculi ocellique obscurè fusci: antennæ nigræ; articulus 1^{us}. rufus; 2^{us}. viridi-fuscus: thorax subтус, utrinque et posticè æneo-viridis: abdomen cupreo-æneum, basi lætè æneo-viride: pedes fulvi; coxæ æneo-virides; femora nigro-fusca; tibiæ fuscæ, basi apice que fulvæ; tarsi flavi, apice fusci; protibiæ et protarsi omninò fulva: alæ subfulvæ; squamulæ fuscæ; nervi fulvi; stigma minimum. (Corp. long. 1 — $1\frac{1}{4}$ lin.; alar. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.)

Var. β.—Antennæ articulo 1^o. apice fusco.

September; on grass beneath trees, near London; North Devonshire.

Sp. 8. Pter. latus. Fem. *Præcedentibus omninò diversus; antennæ breviores; alæ longiores et latiores.*

Viridi-æneus: oculi ocellique obscurè fuscì: antennæ nigræ, subtus fuscae; articulus 1^{us}. rufus: scutellum cupreo-æneum: metathorax viridis: abdomen cupreo-æneum, basi quasi contractum, apice viridi-æneum; segmentum 1^{um}. lætè viride, basi cupreo-æneum: pedes pallidè rufi; coxæ virides; femora et metatibiæ pallidè fusca, apice basique rufa; ungues et pulvilli fuscì: alæ hyalinæ, albæ; squamulæ et nervi pallidè fulva; stigma minutum. (Corp. long. $1\frac{1}{4}$ lin.; alar. $2\frac{1}{4}$ lin.)

May; near London.

Sp. 9. Pter. domesticus. Fem. *P. patulo simillimus; minor; pedes fuscì.*

Æneus: caput viridi-æneum: oculi ocellique obscurè fuscì: antennæ nigræ; articulus 1^{us}. lætè fulvus; 2^{us}. fuscus: thorax subtus, utrinque et posticè æneo-viridis: scutellum et abdomen cupreo-ænea: pedes fuscì; coxæ virides; femora viridi-fusca; tarsi flavi, apice fuscì; meso- et metatibiæ apice basique fulvæ; protibiæ et protarsi omninò fulva: alæ sublimpidæ; squamulæ fuscae; nervi fulvi; stigma minutum. (Corp. long. $\frac{1}{2}$ — $\frac{4}{5}$ lin.; alar. $\frac{3}{4}$ — $1\frac{1}{3}$ lin.)

Var. β.—Thorax æneo-viridis; scutellum æneum.

Var. γ.—Antennæ articulo 1^o. apice fusco.

Var. δ.—Caput viride: thorax æneo-viridis: metathorax cyaneo-viridis: tibiæ omnes fulvæ.

Var. ε.—Thorax viridi-æneus: caput et metathorax viridia.

Var. ζ.—Var. ε. similis: tibiæ omnes fulvæ.

Var. η.—Antennæ articulo 1^o. fusco, basi et subtus fulvo.

Var. θ.—Thorax omninò æneus.

Var. ι.—Caput et thorax viridia.

On the windows and walls of houses in infinite numbers during July, and more sparingly throughout the rest of the year.

Sp. 10. Pter. sylvicola. Fem. *Viridi-æneus, antennis pedibusque rufis, alis limpidis.*

Æneus, parùm nitens: caput viridi-æneum: oculi ocellique obscurè fuscì: antennæ rufæ; articulus 2^{us}. supra pallidè fuscus: thorax utrinque, subtus et posticè viridi-æneus: abdomen cupreo-æneum,

basi lætè viridi-æneum : pedes pallidè rufi ; coxæ æneo-virides ; genna et tarsi flava ; ungues fuscii : alæ limpidæ ; squamulæ fuscæ ; nervi fulvi ; stigma minimum. (Corp. long. $\frac{2}{3}$ — $\frac{3}{4}$ lin. ; alar. $1-1\frac{1}{4}$ lin.)

June ; grass beneath trees ; Windsor Forest and New Forest.

Sp. 11. Pter. discus. Fem. *Æneus, antennis fuscis, pedibus rufis, alis subfuscis disco obscuriore.*

Æneus, parùm nitens : oculi ocellique obscurè fuscii : antennæ fuscæ ; articulus 1^{us}. rufus, apice fuscus : abdomen cupreo-æneum, basi apiceque lætè viridi-æneum : pedes rufi ; coxæ æneo-virides ; tarsi flavi, apice fuscii ; protarsi rufi : alæ subfuscæ ; discus obscurè fuscus ; squamulæ et nervi fulva ; stigma minutum. (Corp. long. $\frac{3}{4}$ — $\frac{4}{5}$ lin. ; alar. $1\frac{1}{4}$ — $1\frac{1}{3}$ lin.)

Var. β .—Abdomen basi cupreo micans.

September ; Isle of Wight.

SECTIO III.—Fem.

Corpus squameum, ferè glabrum, plus minusve longum, plerumque angustum : caput mediocre, thoracis latitudine aut paullò latius : mandibulæ subquadratae, similes, extus ferè rectæ, intus arcuatae, dentibus 4 armatae ; dens 1^{us}. s. externus acutus, mediocris ; 2^{us}. et 3^{us}. breviores, minores ; 4^{us}. obtusus : maxillæ longæ, subarcuatae ; laciniae angustæ, acuminatae, lobatae ; palpi 4-articulati, graciles, filiformes ; articuli 1^{us}. et 2^{us}. æquales, mediocres ; 3^{us}. paullò brevior ; 4^{us}. 2^o. longior, acuminatus : labium longi-ovatum ; ligula brevis, lata, anticè ciliata ; palpi 3-articulati, breves, graciles, filiformes ; articulus 2^{us}. brevissimus, 3^{us}. acuminatus, 1ⁱ. longitudine : antennæ sat graciles, corporis dimidio nonnunquam longiores sed plerumque breviores, articulo 5^o. ad 10^{um}. gradatim crassiores et breviores ; clava longi-ovata, articulo 10^o. plus duplo longior sed non aut vix latior : thorax ovatus, convexus : prothorax minimus : mesothoracis scutum et scutellum maxima ; parapsidum suturæ vix conspicuæ ; paraptera et epimera magna : metathorax parvus : abdomen ovatum aut longi-ovatum, supra planum, subtus carinatum, non compressum nec subtus angulatum, thorace plerumque longius, apice acuminatum et nonnunquam attenuatum ; segmenta subæqualia ; 1^{um}. 5^{um}. et 6^{um}. reliquis paullò longiora : oviductus abdominis

apicem non aut vix transiens: alæ sat latæ; nervus humeralis ulnari multò longior, ramulum rejiciens nullum; cubitalis radiali paulò brevior; stigma ramulum brevissimum emittens.

Subdiv. 1^a.

Corpus angustum, elongatum: antennæ ejus dimidio multò breviores: abdomen longi-ovatum, thorace multò longius; apex attenuatus, alis otiosis non obtectus.

Sp. 12. Pter. gynetelus. Fem. *Viridis aut æneus, antennis nigris, pedibus flavis, alis sublimpidis.*

Lætè viridis, minimè æneo nitens: oculi ocellique obscurè rufi; articulus 1^{us}. obscurè fuscus, basi pallidè flavus: abdomen purpureum; segmenta 1^o. ad 5^{um}. basi lætè viridia: pedes flavi; coxæ virides; genua, meso- et metatarsi pallidè flava, hi apice nigro-fusci; protarsi apice fusci: alæ minimè fulvescentes, ferè limpidæ; squamulæ et nervi pallidè flava, illæ anticè pallidè fuscæ; stigma fuscum, minutum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. $1\frac{1}{2}$ — $1\frac{2}{3}$ lin.)

Var. β.—Thoracis latera cupreo notata: abdominis segmenta purpurea, basi et utrinque lætè viridia; 1^{um}. lætè viride, cupreo varium.

Var. γ.—Cupreo-viridis: abdomen obscurè purpureum; segmenta basi viridi-cuprea, 1^{um}. lætè cupreo-viride.

Var. δ. — Scutellum cupreo-viride: abdominis segmentum 1^{um}. æneo-viride; sequentia basi lætè viridia: femora subfulva.

Var. ε.—Var. δ. similis; tibiæ subfulvæ.

Var. ζ.—Caput viridi-æneum: thorax æneo-cupreus; suturæ æneo-virides: abdominis segmentum 1^{um}. lætè cupreum; sequentia basi obscurè cuprea.

On laurels and box-trees, and in hay-stacks, &c. throughout the year; near London.

Subdiv. 2^a.

Corpus angustum, elongatum: antennæ ejus dimidio breviores: abdomen longi-ovatum, thorace longius, alis obtectum.

Sp. 13. Pter. bracteatus. Fem. *Cupreus aut æneo-viridis, antennis nigris, pedibus flavis, alis plus minusve fulvescentibus.*

Lætè cupreus: caput anticè thoracisque latera viridi-ænea: oculi obscurè fusci: antennæ nigræ; articulus 1^{us}. nigro-viridis, basi

ad medium albidum: abdomen purpureum; segmentum 1^{um}. lætè cupreum; sequentia basi et utrinque æneo-cuprea: oviductus abdominis apicem paullò superans: pedes flavi; coxæ æneo-virides; genua, meso- et metatarsi pallidè flava, hi apice fuscii; protarsi apice fulvi: alæ parùm fulvescentes; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, minutum. (Corp. long. 1—1½ lin.; alar. 1¼—1½ lin.)

Var. β.—Abdominis segmentum 1^{um}. cupreo-viride; sequentia basi cuprea.

Var. γ.—Caput et thorax viridi-cuprea: antennæ articulo 1º. basi flavo: femora, meso- et metatibiæ fulva: alæ vix fulvescentes.

Var. δ.—*Var. γ.* similis: scutellum cupreum: abdomen lætè purpureo-cupreum; segmentum 1^{um}. viride, basi cupreum.

Var. ε.—Æneo-viridis: antennæ articulo 1º. basi flavo: abdominis discus purpureus: alæ vix fulvescentes.

Spring and autumn; on laurels; near London. June; Isle of Wight.

Sp. 14. Pter. herbidas. Fem. *Viridis aut æneo-viridis*, P. bracteato similis, abdomine latiore, antennis nigris, pedibus flavis, alis limpidis.

Lætè viridis: oculi obscurè rufi: antennæ nigræ, corporis dimidio multò breviores; articulus 1^{us}. flavus, apice fuscus: prothorax cupreo-viridis: abdomen lætè æneo-viride; segmentum 1^{um}. viride, cupreo varium; sequentia apice purpurea: pedes flavi; coxæ virides; genua, meso- et metatarsi pallidè flava, hi apice fuscii; protarsi apice fulvi: alæ limpidæ; squamulæ et nervi flava, illæ anticè fulvæ; stigma fulvum, minutum. (Corp. long. ¾—1¼ lin.; alar. 1—1½ lin.)

Var. β.—Antennæ articulo 1º. nigro, basi pallidè flavo: prothorax viridis: abdominis segmentum 1^{um}. omninò viride: stigma fuscum.

Var. γ.—*Var. β.* similis: abdominis segmentum 1^{um}. cupreo-viride.

Var. δ.—Antennæ articulo 1º. nigro, basi flavo: thorax æneo-viridis; mesothoracis scutellum cupreo-æneum.

August; near London.

Sp. 15. Pter. lucidas. Fem. *Cupreo aut æneo-viridis*, P. bracteato aut herbido paullò latior, antennis nigris, pedibus fulvis, alis sublimpidis, stigmatè majore obscuriore.

Cupreo-viridis: oculi obscurè rufi: antennæ nigræ; articulus 1^{us}. flavus, apice fuscus: abdomen viridi-æneum; discus cupreo-

purpureus: pedes fulvi; coxæ æneo-virides; genua, meso- et metarsi pallidè flava, hi apice fusci; protarsi pallidè fulvi, apice saturiores: alæ ferè limpidæ, sub costam minimè fulvescentes; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ lin.)

Var. β. — Æneo-viridis: abdominis segmenta posticè purpurea: propedum tibiæ tarsique flava, hi apice fulvi.

Var. γ. — Antennæ fuscæ; articulus 1^{us}. basi flavus.

Autumn; on laurels; near London.

Sp. 16. Pter. aspilus. Fem. *Cupreo-æneus, præcedentibus propter stigma vix conspicuum diversus, necnon P. bracteato alis latoribus, P. herbido et lucido abdomine angustiore discrepans, antennis fuscis, pedibus fulvis, alis subfulvis.*

Cupreo-æneus, nitens: caput posticè thoracisque segmentorum suturæ æneo-viridia, illum thoracis latitudine: oculi obscurè rufi: antennæ fuscæ; articulus 1^{us}. fulvus: abdomen cupreo-viride, longum, angustum, apice cupreo-æneum attenuatum; segmenta 1^o. ad 4^{um}. apice purpurea: pedes fulvi; coxæ æneo-virides; meso- et metatarsi flavi, apice fusci: alæ subfulvæ; squamulæ et nervi flava, illæ anticè fuscæ; stigma minimum, vix conspicuum. (Corp. long. $1\frac{1}{2}$ lin.; alar. $1\frac{2}{3}$ lin.)

October; on flowers of the ivy; near London.

Sp. 17. Pter. flammiger. Fem. *Rubro-cupreus, præcedentibus gracilior, antennis nigris, pedibus fulvis, alis quàm P. bracteato angustioribus.*

Rubro-cupreus, longus, angustus: caput cupreum, thorace vix latius, posticè æneo-viride: oculi obscurè rufi: antennæ nigræ; articulus 1^{us}. flavus, apice nigro-fuscus: abdomen cupreum, nitens, thorace multò longius; discus purpureus; segmentum 1^{um}. basi utrinque viride: pedes pallidè fulvi; coxæ æneo-virides; meso- et metapedum genua et tarsi flava, hi apice fusci: alæ subfulvæ; squamulæ et nervi fulva, illæ anticè fuscæ; stigma pallidè fuscum, minutum. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ lin.)

Var. β. — Cupreus: caput supra rubro-cupreum, posticè cupreo-viride: abdominis segmenta posticè purpurea.

October; on flowers of the ivy; near London.

Sp. 18. Pter. conspersus. Fem. *Cupreus aut viridi-cupreus, antennis nigris, pedibus fulvis, alis fusco maculatis.*

Cupreus, nitens: caput parvum, breve, thoracis latitudine, anticè viride: oculi obscurè rufi: antennæ nigræ, graciles, corporis dimidio vix breviores; articulus 1^{us}. fulvus: thorax brevis, ferè lævis; prothorax viridi-cupreus: abdomen non attenuatum; discus obscurè purpureus; segmentum 1^{um}. lætè viride, cupreo micans, posticè purpureum: pedes fulvi; coxæ æneo-virides; femora et tibiæ basi suprà pallidè fusca; genua, meso- et metatarsi flava, hi apice fulvi: proalæ subfuscae; maculæ 4 in cunisque disco magnæ diffusæ fuscae; squamulæ et nervi fulva; illæ anticè fuscae; nervus cubitalis quàm cæteris plerisque hujus generis longior; stigma pallidè fuscum, minimum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. $1\frac{1}{2}$ — $1\frac{3}{4}$ lin.)

Var. β.—Femora et tibiæ omninò fulva.

Var. γ.—Abdomen cupreo-viride; discus purpureus.

Var. δ.—Viridi-cupreus: abdomen viride; discus purpureus: alarum maculæ ferè aut omninò obsoletæ.

May and August; on windows; near London. It resembles *Cleonymus* in some particulars.

Sp. 19. Pter. oxygyne. Fem. *Æneo-viridis, capite quàm præcedentibus majore, antennis nigris, pedibus flavis, alis limpidis.*

Lætè æneo-viridis, nitens, longus: caput thorace paullò latius: oculi obscurè rufi: antennæ nigræ; articulus 1^{us}. fulvus, apice fuscus: abdomen lætè viride, angustum, attenuatum; discus purpureus: pedes saturatè flavi; coxæ virides; femora et protarsi fulva; meso- et metatarsi apice fusci: alæ limpidæ; squamulæ et nervi fulva, illæ anticè fuscae; stigma minutum. (Corp. long. $1\frac{1}{2}$ lin.; alar. $1\frac{3}{4}$ lin.)

Var. β.—Caput et thorax viridia: meso- et metapedum tibiæ apice tarsique pallidè flava, hi apice fusci.

July; near London.

Sp. 20. Pter. megachlorus. Fem. *Viridis, antennis nigris, pedibus fuscis, femoribus viridibus, alis griseo-hyalinis.*

Viridis, nitens: caput thorace latius: oculi obscurè rufi: antennæ nigræ; articulus 1^{us}. nigro-viridis: thoracis discus æneo-viridis: abdominis segmentum 1^{um}. basi cyaneo-viride; sequentia posticè

cuprea: pedes fuscī; coxæ et femora viridia; meso- et metapedum tibiæ apice et basi tarsique pallidè flava; hi ad apices fuscī; progenua et protarsi subtus fulva: alæ griseo-limpidæ; squamulæ et nervi fusca, illæ anticè virides; stigma obscurius, magnum. (Corp. long. $1\frac{1}{2}$ lin.; alar. $2\frac{1}{4}$ lin.)

Found near London.

Subdiv. 3^a.

Corpus angustum, elongatum; antennæ ejus dimidii longitudine: abdomen longi-ovatum, thorace vix longius.

Sp. 21. Pter. grandis. Fem. *Viridis, antennis fuscis, pedibus flavis, alis limpidis.*

Lætè viridis, nitens: caput thorace paullò latius: oculi rufi: antennæ fuscae, graciles, ferè filiformes; articulus 1^{us}. pallidè fulvus, apice supra fuscus: prothorax mesothoracisque latera æneo-viridia: abdomen viridi-cupreum, thorace paullò angustius; discus purpureus; segmentum 1^{um}. cupreo-viride micans: pedes lætè flavi; coxæ virides; femora fulvæ; metatibiæ basi cingulata fulvo; tarsi apice fuscī; protibiæ et protarsi pallidè fulva, hi apice fuscī: alæ albo-limpidæ; squamulæ et nervi flava, illæ anticè nigræ, stigma fuscum, minutum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. $1\frac{3}{4}$ — $2\frac{1}{4}$ lin.)

Var. β.—Thorax supra æneo-viridis.

September; near London. Isle of Wight.

Sp. 22. Pter. aurifer. Fem. *Aureo-viridis, antennis nigris, pedibus flavis, alis limpidis.*

Lætè aureo-viridis: caput viride: oculi obscurè rufi: antennæ nigræ, longæ; articulus 1^{us}. flavus, apice nigro-fuscus: abdominis discus purpureus; segmentum 1^{um}. cupreum, viridi micans: pedes lætè flavi; coxæ æneo-virides; femora fulva; meso- et metatarsi pallidè flavi, apice nigri; protarsi apice fulvi: alæ limpidissimæ; squamulæ et nervi flava, illæ anticè fuscae; stigma fuscum, minutum. (Corp. long. $1\frac{1}{2}$ lin.; alar. 2 lin.)

Found near London.

Subdiv. 4^a.—Fem.

Fem.—Corpus mediocre, vix elongatum: antennæ ejus dimidio breviores: abdomen ovatum, thorace paullò longius.

Mas.—(P. tenuis.) Corpus breve: caput thorace paullo latius: antennæ subfiliformes, corporis dimidio longiores; articulus 1^{us}. validus subfusiformis; 5^{us}. et sequentes ad 10^{um}. gradatim breviores, non latiores; clava longi-ovata acuminata, articulo 10^o. plus duplò longior et paullo latior: thorax ovatus: abdomen ovatum thoracis longitudine.

Sp. 23. Pter. robustus. Fem. *Cupreo-æneus, crassus, antennis nigris, pedibus fulvis, alis sublimpidis parvis.*

Æneus, parùm nitens, crassus: oculi obscure fusi: antennæ nigræ, validæ; articulus 1^{us}. flavus, apice niger: thorax anticè et posticè cupreo-æneus: abdomen lætè viridi-cupreum; discus obscure purpureus; segmentum apicale chalybeum, paullo attenuatum: pedes fulvi; coxæ æneo-virides; femora fusca; meso- et metatarsi pallidè flavi, apice nigri; protarsi flavi, apice fusi: alæ breves, ferè limpidae; squamulae et nervi flava, illæ anticè fuscæ; stigma obscure fuscum, mediocre. (Corp. long. $1\frac{1}{2}$ — $1\frac{1}{2}$ lin.; alar. $1\frac{2}{3}$ — $1\frac{3}{4}$ lin.)

Found near London.

Sp. 24. Pter. nubilus. Fem. *Cupreo-æneus, P. robusto gracilior, antennis nigris, pedibus fulvis, alis subfuscis disco obscuriore.*

Cupreo-æneus, parùm nitens: oculi obscure fusi: antennæ nigræ, validæ; articulus 1^{us}. flavus, apice fulvus: abdomen lætè viridi-cupreum; discus et apex obscure purpurei, hic attenuatus: pedes fulvi; coxæ æneo-virides; femora fusca; genua et protarsi flava, hi apice fulvi; meso- et metatarsi pallidè flavi, apice nigro-fusi: alæ subfuscæ; macula in cujusque disco diffusa fusca; squamulae et nervi flava, illæ anticè fuscæ; stigma mediocre, fuscum. (Corp. long. $\frac{4}{5}$ — $1\frac{1}{4}$ lin.; alar. $1\frac{1}{4}$ — $1\frac{2}{3}$ lin.)

Var. β.—Thoracis discus purpureo-cupreus.

Var. γ.—Viridi-æneus: abdomen viride, basi cupreo micans; discus et apex obscure purpurei: femora obscure fusca; meso- et metatarsi apice fusi.

March; on laurels; near London. September; Isle of Wight.

Sp. 25. Pter. perfectus. Fem. *Obscurè cupreus, P. nubili statura, antennis nigris, pedibus fulvis, alis sublimpidis.*

Obscurè cupreus, vix nitens: oculi obscure fusi: antennæ nigræ, validæ; articulus 1^{us}. basi fulvus: abdomen lætè viridi-cupreum;

discus et apex purpurei, hic paullò attenuatus: pedes fulvi; coxæ æneo-virides; meso- et metapedum genua et tarsi pallidè flava, hi apice nigri: alæ ferè limpidæ; squamulæ et nervi pallidè fusca, illæ anticè virides; stigma obscurè fuscum, mediocre. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ lin.)

September; Isle of Wight.

Sp. 26. Pter. apertus. Fem. *Æneo-viridis cupreo varius*, P. perfecti *statura stigmatè minore, antennis nigris, pedibus fulvis, alis limpidis*.

Æneo-viridis, nitens: caput thorace paullò latius: oculi obscurè rufi: antennæ nigræ; articulus 1^{us}. viridis, basi fulvus: mesothoracis scutellum et metathorax cupreo-ænea: abdomen cupreo-viride; segmentum 1^{um}. nitentius; discus purpureus: pedes fulvi; coxæ virides; femora nisi ad apices fusca; meso- et metapedum genua, tibiæ apice tarsique flava, hi apice fusi: alæ limpidæ; squamulæ et nervi pallidè fulva, illæ anticè nigræ; stigma fuscum, parvum. (Corp. long. $1\frac{1}{2}$ lin.; alar. $1\frac{2}{3}$ lin.)

June; Isle of Wight.

Sp. 27. Pter. dives. Fem. *Cupreo-æneus*, P. perfecti *statura, antennæ graciliores nigræ, pedes pallidè fulvi, alæ subfulvæ*.

Cupreo-æneus, nitens: caput æneo-viride: oculi obscurè rufo-fusci: antennæ nigræ, graciles; articulus 1^{us}. basi flavus: abdominis segmenta posticè purpurea, nonnulla viridi nitentia; apex obscurè purpureus, non attenuatus: pedes pallidè fulvi; coxæ æneo-virides; genua et tarsi pallidè flava, hi apice fusi; propedum genua tibiæ et tarsi flava, hi apice fulvi: alæ ferè limpidæ, minimè fulvescentes; squamulæ et nervi pallidè flava, illæ anticè fusæ; stigma fuscum, parvum. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ lin.)

Found near London.

Sp. 28. Pter. cuprinus. Fem. *Cupreus, præcedentibus minor et brevior, antennis nigris, pedibus fulvis, alis subfulvis*.

Cupreus, parùm nitens: caput æneo-viride: oculi obscurè fusi: antennæ nigræ; articulus 1^{us}. flavus, apice fuscus: abdomen lætè cupreo-viride, basi angustum, apice non attenuatum; segmenta apice purpurea: pedes pallidè fulvi; coxæ æneo-virides; genua,

meso- et metatarsi pallidè flava, hi apice fusci; protarsi apice fulvi: alæ ferè limpidæ, minimè fulvescentes; squamulæ et nervi pallidè flava, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long. $\frac{4}{5}$ lin.; alar. $1\frac{1}{8}$ lin.)

Found near London.

Sp. 29. Pter. obtusus. Fem. *Viridi-æneus*, P. cuprino *lterior, antennis nigris, pedibus fulvis, alis limpidis.*

Viridi-æneus: caput posticè viride: oculi obscurè rufi: antennæ nigræ; articulus 1^{us}. flavus, apice fuscus: abdomen lætè viride, apice non attenuatum; discus purpureus; segmentum 1^{um}. viridicupreum: pedes pallidè fulvi; coxæ æneo-virides; genua, meso- et metatarsi flava, hi apice fusci: alæ limpidæ, latæ, apice obtusæ; squamulæ et nervi pallidè flava, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long. 1 lin.; alar. $1\frac{1}{4}$ lin.)

Found near London.

Sp. 30. Pter. curtus. Fem. *Viridis, præcedentibus brevior, antennis nigris, pedibus fulvis, alis limpidis.*

Viridis, brevis, latus: oculi obscurè rufi: antennæ nigræ; articulus 1^{us}. flavus, apice nigro-fuscus: abdomen lætè viride, apice non attenuatum; segmentum 1^{um}. apice cupreum; sequentia apice purpurea: pedes fulvi; coxæ virides; meso- et metapedum genua et tarsi pallidè flava, hi apice nigri; protarsi flavi, apice fusci: alæ limpidæ, latæ, apice obtusæ; squamulæ et nervi pallidè flava, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long. $\frac{4}{5}$ lin.; alar. $1\frac{1}{2}$ lin.)

September; Isle of Wight.

Sp. 31. Pter. pinguis. Fem. *Cupreus*. P. curto *adhuc lterior, antennis nigris, pedibus fulvis, alis limpidis.*

Obscurè cupreus, latus, brevis, parùm nitens: caput viride, thorace vix latius: oculi obscurè rufi: antennæ nigræ, corporis dimidio vix breviores; articulus 1^{us}. flavus, apice fulvus: abdomen æneocupreum, nitens, thorace paullò longius; discus obscurè purpureus: pedes fulvi; coxæ æneo-virides; meso- et metapedum genua et tarsi pallidè flava, hi apice fusci: alæ limpidæ; squamulæ et nervi pallidè fulva, illæ anticè fuscæ; stigma pallidè fuscum, minutum. (Corp. long. 1 lin.; alar. $1\frac{1}{2}$ lin.)

September; near Exeter, Devonshire.

Sp. 32. Pter. chalceus. Fem. *Cupreus aut cupreo-viridis, præcedentibus gracilior, antennis nigris, pedibus pallidè fulvis, alis minimè fulvis.*

Cupreus, nitens: oculi obscure rufo-fusci: antennæ nigræ, graciles; articulus 1^{us}. basi flavus: abdominis segmenta anticè cupreo-viridia, posticè purpurea; apex vix attenuatus: pedes pallidè fulvi; coxæ æneo-virides; genua et tarsi pallidè flava, hi apice fusci; propedum genua tibiæ et tarsi flava, hi apice fulvi: alæ ferè limpidæ, minimè fulvescentes; squamulæ et nervi pallidè flava, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{2}{3}$ lin.)

Var. β.—Cupreo-viridis: caput æneo-viride: thoracis segmentorum suturæ virides: abdominis apex obscure purpureus.

Found near London.

Sp. 33. Pter. brevicornis. Fem. *P. chalceo similis, capite minore, antennis brevioribus.*

Cupreus, nitens: caput parvum, anticè viride: oculi obscure rufi: antennæ nigræ, breves; articulus 1^{us}. pallidè flavus, apice obscure fuscus: abdomen lætè viridi-cupreum; discus et apex purpurei, hic vix attenuatus: pedes flavi; coxæ æneo-virides; femora pallidè fulva; genua, meso- et metatarsi pallidè flava, hi apice fusci; protarsi apice fulvi: alæ ferè limpidæ, minimè fulvescentes, apice obtusæ; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long. $1\frac{1}{2}$ — $1\frac{1}{4}$ lin.; alar. $1\frac{1}{3}$ — $1\frac{1}{2}$ lin.)

Var. β.—Thorax cupreo-viridis: abdominis segmentum 1^{um}. lætè viride, cupreo micans; sequentia lætè cuprea: meso- et metatibiæ pallidè fulvæ.

Var. γ.—Thorax viridi-æneus: caput viride, posticè æneo-viride: antennæ articulo 1^o. nigro, basi fulvo.

Found near London; New Lanark, Scotland.

Sp. 34. Pter. despectus. Fem. *Viridis, P. chalcei statura, abdomini fasciis purpureis, antennis nigris, pedibus flavis, alis limpidis.*

Lætè viridis, nitens: caput thorace vix latius: oculi obscure rufi: antennæ nigræ; articulus 1^{us}. flavus, apice nigro-fuscus: abdomen cupreo-viride; segmenta posticè purpureo fasciata, fasciæ in disco marginem anticum attingentes: pedes lætè flavi; coxæ virides; femora, protibiæ et protarsi fulva; meso- et metapedum tibiæ

fulvo cingulatæ; tarsi apice nigro-fusci: alæ limpidae; squamulae et nervi fulva, illæ anticè fuscæ; stigma fuscum, minutum. (Corp. long. $1\frac{1}{2}$ lin.; alar. $1\frac{2}{3}$ lin.)

July; near London.

Sp. 35. Pter. affinis. Fem. *Cupreo-viridis*, P. despecto *similis, at minor et brevior, antennis nigris, pedibus fulvis, alis sublimpidis.*

Cupreo-viridis, parùm nitens: caput thorace paullò latius: oculi obscurè rufi: antennæ nigræ; articulus 1^{us}. basi flavus: abdomen viride, nitens; segmenta posticè purpurea: pedes fulvi; coxæ æneo-virides; genua, meso- et metatarsi flava, hi apice fusci: alæ vix fuscæ, ferè limpidae; squamulae et nervi flava, hi anticè fusci; stigma parvum, fuscum. (Corp. long. $\frac{3}{4}$ —1 lin.; alar. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.)

Found near London.

Sp. 36. Pter. fumipennis. Fem. *Viridis aut viridi-æneus*, P. nubilo *minor et brevior, antennis nigris, pedibus fulvis, alis subfuscis disco obscuriore.*

Æneo-viridis, parùm nitens, angustus, præcedentis statura at minor: caput thorace paullò latius: oculi obscurè rufi: antennæ nigræ, corporis dimidio vix breviores; articulus 1^{us}. basi fulvus: abdomen viridi-æneum, nitens, angustum; discus purpureus: pedes pallidè fulvi; coxæ æneo-virides; meso- et metatarsi flavi, apice fusci; protarsi apice saturatè fulvi: alæ subfuscæ; macula in cujusque disco maxima diffusa fusca; squamulae et nervi fulva; stigma minutum. (Corp. long. $\frac{3}{4}$ —1 lin.; alar. 1— $1\frac{1}{2}$ lin.)

Var. β .—Caput et thorax viridia.

Var. γ .—Caput et thorax viridi-ænea: antennæ articulo 1^o. fulvo, apice fusco.

Winter; in haystacks; Spring; on laurels; near London.

Sp. 37. Pter. redactus. Fem. *Viridis aut viridi-æneus, præcedentis statura et magnitudine, antennis nigris, pedibus fulvis, alis subfuscis.*

Æneo-viridis, parùm nitens: caput thorace vix latius: oculi obscurè rufi: antennæ nigræ, corporis dimidio vix breviores; articulus 1^{us}. fulvus, apice nigro-fuscus; abdomen nitens, angustum; discus obscurè purpureus: pedes pallidè fulvi; coxæ æneo-virides,

protarsi apice saturatè fulvi; meso- et metatarsi flavi, apice fusci: alæ subfuscae; squamulae et nervi fulva; stigma obscurius, minimum. (Corp. long. $\frac{2}{3}$ — $\frac{3}{4}$ lin.; alar. $\frac{4}{5}$ —1 lin.)

Var. β.—Caput et thorax viridia.

Var. γ.—Viridi-æneus: antennæ articulo 1^o. nigro-fusco, basi fulvo: abdominis discus obscurè purpureus.

Var. δ.—Antennæ articulo 1^o. flavo, apice fusco.

September; Lyme Regis, Dorsetshire; Penzance, Cornwall; Linton, North Devonshire.

Sp. 38. Pter. epistenus. Fem. *Æneus, thorace angusto distinctus, abdomine viridi fasciato, antennis nigris, pedibus fuscis, alis fulvis aut limpidis.*

Æneus, parùm nitens, præcedentibus abdomine brevior distinctus: caput æneo-viride, thorace vix latius: oculi obscurè rufi: antennæ nigrae, breves, validæ; articulus 1^{us}. flavus, apice fuscus: thorax angustus, abdomine vix brevius: abdomen æneo-purpureum, nitens, thorace multo latius; segmenta basi viridia: pedes fusci; coxæ æneo-virides; femora æneo-fusca; meso- et metapedum genua et tarsi flava, hi apice fusci; protarsi fulvi: alæ angustæ, subfulvæ, ad costam saturatiores; squamulae et nervi fulva, illæ anticè fuscae; stigma fuscum, parvum. (Corp. long. $1\frac{1}{6}$ — $1\frac{1}{4}$ lin.; alar. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.)

Var. β.—Abdominis segmentum 1^{um}. lætè viride, apice æneo-purpureum.

Var. γ.—Caput et thorax æneo-viridia: antennæ articulo 1^o. omninò flavo: alæ limpidæ.

Found near London. June; Windsor Forest.

Sp. 39. Pter. purpureus. Fem. *Purpureus, abdomine æneo-viridi, antennis fuscis, pedibus flavis, alis limpidis.*

Purpureus, parùm nitens: caput æneo-cupreum, thorace paullò latius, anticè viride: oculi obscurè rufi: antennæ obscurè fuscae; articulus 1^{us}. flavus: thorax angustus, abdomine vix brevius: abdomen æneo-viride, angustum; discus obscurè purpureus: pedes flavi; coxæ æneo-virides; pro- et mesopedum femora et tibiæ fulva; meso- et metatarsi apice fusci: alæ limpidæ; squamulae et nervi pallidè flava; stigma minimum. (Corp. long. $1\frac{1}{6}$ lin.; alar. $1\frac{1}{2}$ lin.)

Found near London.

Sp. 40. Pter. semifascia. Fem. *Viridi-æneus, antennis fulvis, pedibus fuscis, alis fusco ad stigma maculatis.*

Viridi-æneus, parùm nitens : caput viride, thorace vix latius : oculi obscure rufi : antennæ fulvæ ; articulus 1^{us}. pallidior : abdomen basi nitentius ; discus obscure purpureus : pedes fusi ; coxæ et femora viridia ; meso- et metapedum tibiæ apice tarsique flava, hi apice fusi ; protarsi fulvi : alæ sublimpidæ, ad cujusque stigma macula fusca in discum producta ; squamulæ et nervi fulva, illæ anticè viridi-fuscae ; stigma pallidè fuscum, parvum. (Corp. long. $\frac{3}{4}$ lin. ; alar. $1\frac{1}{3}$ lin.)

June ; Windsor Forest.

Sp. 41. Pter. venustus. Fem. *Viridi-cyaneus, antennis pedibusque fuscis, alis griseis.*

Viridi-cyaneus, brevis, latus : caput thorace vix latius : oculi obscure rufi : antennæ fuscae ; articulus 1^{us}. fulvus : abdomen æneo-viride, basi nitentius ; discus obscure purpureus : pedes fusi ; coxæ cyaneo-virides ; genua fulva ; tibiæ apice tarsique pallidè flava, hi apice fusi ; protarsi supra pallidè fulvi : alæ griseæ ; discus obscurior ; squamulæ et nervi fusca, illæ anticè cyaneo-fuscae ; stigma obscure fuscum, mediocre. (Corp. long. $1\frac{1}{4}$ lin. ; alar. $1\frac{3}{4}$ lin.)

Var. β .—Caput et thorax cyaneo-viridia : abdomen basi viridi-cupreum : protibiæ et protarsi fulva, illæ supra pallidè fuscae.

July ; near London.

Sp. 42. Pter. anticus. Fem. *Cupreo-viridis, antennis fulvis apice fuscis, pedibus fulvis, alis limpidis.*

Cupreo-viridis, parùm nitens : caput viride, thorace paullò latius : oculi obscure rufi : antennæ fulvæ ; articuli 3^{us}. et 4^{us}. flavi ; 2^{us}., 11^{us}., 12^{us}. et 13^{us}. fusi : abdomen viridi-cupreum, nitens ; discus purpureus : pedes fulvi ; coxæ æneo-virides ; meso- et metapedum genua, tibiæ apice et tarsi pallidè flava, hi apice fusi ; propedum genua, tibiæ et tarsi flava : alæ limpidæ ; squamulæ et nervi pallidè fulva ; stigma fuscum, parvum. (Corp. long. $1\frac{1}{4}$ lin. ; alar. $1\frac{1}{2}$ lin.)

Found near London.

Sp. 43. Pter. varius. Fem. *Viridi-æneus, antennis pedibusque fuscis, femoribus viridibus, alis subfulvis.*

Viridi-æneus : caput thorace vix latius : oculi fusi : antennæ fuscae, graciles ; articulus 1^{us}. fulvus : abdomen viridi-cupreum, acumina-

tum, vix attenuatum, basi lætè viride; discus obscurè purpureus: oviductus rufus: pedes fuscì; coxæ et femora viridia; tibiæ apice tarsique pallidè fulva, hi apice fuscì: alæ subfulvæ, ad costam saturatiores; squamulæ et nervi fulva, illæ anticè viridifuscæ; stigma fuscum, parvum. (Corp. long. $\frac{3}{4}$ — $1\frac{1}{6}$ lin.; alar. $1-1\frac{1}{2}$ lin.)

Var. β.—Abdomen purpureum; segmentum 1^{um} . lætè viride, apice cupreo-purpureum; sequentia basi utrinque viridia.

Var. γ.—Abdominis segmentum 1^{um} . cyaneo-viride, cupreo varium. June; New Forest.

Sp. 44. Pter. rufinus. Fem. *Æneo-cupreus, antennis fuscis, pedibus rufis, alis fulvis.*

Æneo-cupreus, parùm nitens: caput æneo-viride, thorace vix latius: oculi obscurè fuscì: antennæ fuscæ; articulus 1^{us} . fulvus, apice nigro-fuscus: abdomen cupreum, basi nitentius; discus obscurè purpureus: pedes rufi; coxæ virides; meso- et metatarsi flavi: apice fuscì: alæ saturatè fulvæ, basi apice et posticè dilutiores; squamulæ et nervi fulva, illæ anticè fuscæ; stigma pallidè fuscum, parvum. (Corp. long. $\frac{2}{3}$ lin.; alar. 1 lin.)

June; Isle of Wight.

Sp. 45. Pter. sequester. Fem. *Cupreo-æneus, viridi varius, antennis pedibusque fuscis, femoribus viridibus, alis limpidis.*

Cupreo-æneus, parum nitens: caput viride, thoracis latitudine. oculi obscurè rufi: antennæ obscurè fuscæ, graciles; articulus 1^{us} . fulvus: metathorax viridis: abdomen cupreo-purpureum, nitens; segmentum 1^{um} . lætè viride, apice cupreo-purpureum; sequentia basi utrinque viridia: pedes fuscì; coxæ et femora viridia; genua, protibiæ et protarsi fulva; meso- et metapedum tibiæ apice tarsique flava, hi apice fuscì: alæ limpidæ; squamulæ et nervi fulva, illæ anticè virides; stigma parvum, fuscum. (Corp. long. $1-1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}-1\frac{3}{4}$ lin.)

Var. β.—Antennæ articulo 1^o . apice fusco.

April; near London. September; Linton, North Devonshire.

Sp. 46. Pter. saturatus. Fem. *Aureo-viridis, antennis fuscis, abdomine cupreo-viride, pedibus fulvis, alis subfulvis.*

Lætè aureo-viridis, angustus: caput thorace paullò latius: oculi obscurè rufi: antennæ obscurè fuscæ; articulus 1^{us} . fulvus:

abdomen cupreo-viride, nitens, thorace angustius et paullo longius; segmenta posticè cupreo-purpurea: pedes pallidè fulvi; coxæ æneo-virides; tarsi flavi, apice fuscis: alæ subfuscae, ad costam saturatiores; squamulæ et nervi fulva, illæ anticè fuscae; stigma pallidè fuscum, minutum. (Corp. long. $1\frac{1}{4}$ lin.; alar. 2 lin.)

Found near London.

Sp. 47. Pter. futilis. Fem. *Viridi-æneus, antennis fuscis, pedibus fulvis, alis subfuscis.*

Viridis: caput thorace vix latius: oculi obscurè rufi: antennæ obscurè fuscae; articulus 1^{us}. basi flavus: abdomen viridi-æneum, nitens, thorace paullo longius; discus obscurè purpureus: pedes fulvi; coxæ virides; genua necnon meso- et metapedum tarsi basi pallidè flava: alæ subfuscae; squamulæ et nervi fulva, illæ anticè fuscae; stigma pallidè fuscum, parvum. (Corp. long. $\frac{4}{5}$ lin.; alar. $1\frac{1}{4}$ lin.)

New Lanark, Scotland.

Sp. 48. Pter. decorus. Fem. *Viridi-cupreus, P. sequestri similis, antennis crassioribus nigro-fuscis, abdomine viridi nitente, pedibus fulvis, alis sublimpidis.*

Viridi-cupreus, parum nitens: caput posticè viride: oculi obscurè fuscis: antennæ nigro-fuscae; articulus 1^{us}. pallidè fulvus, apice fuscus: abdomen cupreo-viride, nitens; discus purpureus: pedes fulvi; coxæ æneo-virides; meso- et metapedum tibiæ tarsique pallidè flava, hi apice fuscis, illæ fulvo cingulatæ; alæ ferè limpidæ, parum fulvescentes; squamulæ et nervi flava, illæ anticè fuscae; stigma fuscum, parvum. (Corp. long. 1— $1\frac{1}{4}$ lin.; alar. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.)

Var. β .—Tibiæ omnes fulvæ.

Var. γ .—Caput posticè æneo-viride.

Var. δ .—Abdomen lætè viride; segmentum 1^{um}. cupreo et cyaneo micans; sequentium margines postici purpurei, utrinque cuprei.

October; on laurels; near London. New Lanark, Scotland.

Sp. 49. Pter. famulus. Fem. *Viridis aut viridi-æneus, P. decoro similis at paullo brevior, antennis nigro-fuscis, pedibus flavis, femoribus fuscis, alis sublimpidis.*

Viridi-æneus: caput posticè viride: oculi obscurè rufi: antennæ nigro-fuscae; articulus 1^{us}. flavus, apice fuscus: abdomen cupreo-viride, nitens; discus purpureus: pedes flavi; coxæ æneo-virides; femora fusca; meso- et metapedum genua et tarsi pallidè flava;

hi apice nigro-fusci; protarsi fulvi: alæ limpidæ, sub costam minimè flavescentes; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, minutum. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ lin.)

Var. β.—Caput et thorax viridia: antennæ articulo 1^o. nigro-fusco, basi flavo.

October; on laurels; near London.

Sp. 50. Pter. perpetuus. Fem. *Viridis aut æneo-viridis, P. famulo simillimus sed angustior, antennis fuscis aut nigro-fuscis, pedibus flavis, femoribus fulvis, alis limpidis.*

Æneo-viridis: oculi obscurè rufi: antennæ fuscæ; articulus 1^{us}. flavus, apice fuscus: abdomen nitens; discus purpureus: pedes flavi; coxæ æneo-virides; femora fulva, apice flava; meso- et metapedum genua et tarsi pallidè flava, hi apice fusci; protarsi pallidè fulvi: alæ limpidæ; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, minutum. (Corp. long. $\frac{2}{3}$ —1 lin.; alar. $\frac{3}{4}$ — $1\frac{1}{2}$ lin.)

Var. β.—Viridis: abdominis discus purpureus.

Var. γ.—Caput viride: mesothoracis scutellum cupreo-æneum: abdomen viridi-æneum; discus purpureus.

Var. δ.—Caput viride: thoracis discus cupreo-æneus.

Var. ε.—Tibiæ fulvo cingulatæ.

Var. ζ.—Antennæ articulo 1^o. nigro-fusco, basi flavo.

Var. η.—Antennæ nigro-fuscæ.

Var. θ.—*Var. ζ.* similis: abdomen basi viridi-cupreum: femora basi fusca.

Var. ι.—Femora et protarsi flava, hi apice fusci.

Var. κ.—Abdomen viride, basi cyaneo-viride; discus purpureus.

Common near London, on the lauristinus, the box, the cypress, &c. throughout the year.

Sp. 51. Pter. viridulus. Fem. *Viridis, P. perpetuo similis sed angustior et plerumque minor, antennis fuscis, pedibus flavis, alis limpidis.*

Lætè viridis: oculi obscurè rufi: antennæ fuscæ; articulus 1^{us}. flavus, apice fuscus: abdomen cupreo nitens; discus purpureus: pedes flavi; coxæ virides; genua, meso- et metatarsi pallidè flava, hi apice fusci; protarsi apice fulvi: alæ limpidæ; squamulæ et

nervi flava, illæ anticè fuscæ; stigma pallidè fuscum, minutum.
(Corp. long. $\frac{2}{3}$ — $\frac{4}{5}$ lin.; alar. $\frac{4}{5}$ — $1\frac{1}{4}$ lin.)

Var. β.—Thoracis discus æneo-viridis: femora fulva; tibiæ fulvo cingulatæ.

Var. γ.—Femora basi fulva; meso- et metatarsi apice nigro-fusci.

Var. δ.—Cyaneo-viridis: abdominis discus cupreo-purpureus.

Found with the preceding species; August; on windows, &c.

Sp. 52. *Pter. tenuis*. Mas. *Æneo-viridis, antennis flavis fusco cingulatis et terminatis, abdomine flavo fasciato, pedibus flavis, alis sublimpidis*. Fem. *P. viridulo longior et angustior, antennis fuscis, abdomine immaculato, pedibus fulvis*.

Mas.—Æneo-viridis: oculi obscurè rufi: antennæ fulvo-flavæ; articulus 1^{us}. basi flavus, apice supra fuscus; 2^{us}. supra basi, 5^{us}. 6^{us}. et 7^{us}. omninò, 8^{us}. basi, 10^{us}. et sequentes fusci: abdomen viride, ante medium latè flavo fasciatum; discus cupreus: pedes flavi; coxæ virides; tarsi apice pallidè fusci; protibiæ et protarsi fulva: alæ ferè limpidæ, minimè fulvescentes; squamulæ et nervi flava, illæ anticè fuscæ; stigma pallidè fuscum, minutum.

Fem.—Antennæ obscurè fuscæ; articulus 1^{us}. basi flavus: abdomen viridi-æneum, apice paullò attenuatum; discus purpurascens: pedes fulvi; coxæ æneo-virides; genua, meso- et metatarsi flava, hi apice fusci; protarsi pallidè fulvi, apice saturatiores. (Corp. long. $\frac{1}{2}$ — $\frac{2}{3}$ lin.; alar. $\frac{1}{2}$ —1 lin.)

Var. β.—*Mas* et *Fem.* caput et thorax viridia.

Var. γ.—*Mas*, antennæ articulis 1^o. et 8^o. omninò fulvo-flavis.

Var. δ.—*Mas*, antennæ articulis 1^o. 9^o. et 10^o. flavis.

Var. ε.—*Mas*, mesotibiæ apice basique necnon metatibiæ basi fulvæ.

Var. ζ.—*Fem.* antennæ pallidiore; articulus 1^{us}. nigro-fuscus, basi flavus: abdomen æneo-viride; discus purpureus: tibiæ pallidè fulvæ.

Var. η.—*Fem.* abdomen basi utrinque cupreum.

Var. θ.—*Fem.* caput et thorax viridi-ænea.

In the spring, summer, and autumn; on laurels, lime trees, windows, &c.; near London. September; Isle of Wight, Isle of Portland.

Sp. 53. Pter. pexatus. Fem. *Viridis, antennis fuscis, scutello cyaneo, pedibus flavis, alis sublimpidis.*

Viridis, *P. perpetuo* simillimus, alæ angustiores: caput thorace vix latius: oculi obscurè rufi: antennæ fuscæ, subtus flavæ; articulus 1^{us}. flavus, apice fuscus: mesothoracis epimera, paraptera et scutellum cyanea; metathorax æneo-viridis: abdomen viridi-æneum; discus obscurè purpureus; segmentum 1^{um}. lætè cupreo-viride: pedes flavi; coxæ virides; meso- et metatarsi pallidè flavi; tarsi omnes apice fulvi: alæ ferè limpidæ, minimè fulvescentes; squamulæ et nervi flava, illæ anticè fuscæ; stigma minimum. (Corp. long. $\frac{2}{3}$ lin.; alar. $1\frac{1}{4}$ lin.)

Found near London.

Sp. 54. Pter. inops. Fem. *Viridi-æneus, P. perpetuo similis, antennis nigro-fuscis, pedibus fulvis, mesofemoribus pallidè fuscis, alis sublimpidis.*

Viridi-æneus, brevis: caput thorace paullò latius: oculi obscurè rufi: antennæ nigro-fuscæ; articulus 1^{us}. niger, basi flavus: abdomen æneo-viride, thorace paullò longius, basi cupreo-varium: pedes fulvi; coxæ æneo-virides; meso- et metapedum genua, tibiæ apice tarsique flava, hi apice fuscii; mesofemora pallidè fusca: alæ ferè limpidæ, minimè fulvescentes; squamulæ et nervi pallidè flava, illæ anticè obscuriores; stigma fulvum, minimum. (Corp. long. $\frac{5}{8}$ lin.; alar. 1 lin.)

September; Lyme Regis, Dorsetshire.

Sp. 55. Pter. detritus. Fem. *P. viriduli statura, antennæ graciliores, abdomen latius.*

Æneus, obscurus, *P. innoto* longior, *P. viridulo* thorace brevior distinctus: caput thorace paullò latius: oculi obscurè fuscii: antennæ nigro-fuscæ; articulus 1^{us}. niger, basi fulvus: abdomen cupreum, nitens, basi et utrinque viride, apice paullò attenuatum: pedes fulvi; coxæ æneo-virides; meso- et metatarsi flavi, apice fuscii: alæ parùm fulvescentes; squamulæ et nervi fulva; stigma minutum. (Corp. long. $\frac{2}{3}$ lin.; alar. 1 lin.)

September; Lyme Regis, Dorsetshire.

Sp. 56. Pter. inscitus. Fem. *Purpureo-cupreus, præcedentibus propter antennas breviores discretus, abdominis segmentis basi viridibus, antennis pedibusque fuscis, alis subfulvis.*

Obscurè cupreus, parùm nitens: caput thorace vix latius: oculi obscurè rufi: antennæ fuscæ, graciles, corporis triente non lon-

giores; articulus 1^{us}. fulvus: thoracis discus cupreo-purpureus: abdomen lætè viride, apice paullò attenuatum; segmenta posticè cupreo-purpurea: pedes pallidè fuscì; coxæ æneo-virides; femora viridia, basi apiceque fulva; meso- et metapedum genua et tarsi pallidè flava, hi apice fuscì; propedum tibiæ tarsique fulva: alæ subfulvæ, ad costam saturatiores; squamulæ et nervi flava, illæ anticè fuscæ; stigma fuscum, parvum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. $1\frac{1}{2}$ — $1\frac{3}{4}$ lin.)

Var. β.—Abdominis segmenta viridi-ænea, posticè cupreo-purpurea.

Var. γ.—Caput et thorax cupreo-ænea.

Var. δ.—Caput viridi-æneum.

Found near London.

Sp. 57. *Pter. tristis*. Fem. *Viridi-cupreus*, P. incito *brevior, antennis femoribusque fuscis, pedibus flavis aut fulvis, alis sublimpidis*.

Viridi-cupreus, parùm nitens: oculi obscurè rufi: antennæ fuscæ, graciles; articulus 1^{us}. flavus: abdomen æneo-viride, nitens; discus purpureus: pedes flavi; coxæ æneo-virides; femora fusca, apice flava; meso- et metapedum genua et tarsi pallidè flava, hi apice fuscì; alæ ferè limpida, minimè fulvescentes; squamulæ et nervi flava; stigma pallidè fulvum, minutum. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. $1\frac{1}{2}$ — $1\frac{3}{4}$ lin.)

Var. β.—Tibiæ et protarsi fulva.

Var. γ.—Viridi-æneus: abdominis segmentum 1^{um}. lætè viride, apice cupreo-purpureum; sequentia apice purpurea.

Var. δ.—Meso- et metatibiæ fusco cingulata.

Var. ε.—Abdomen viride; segmenta posticè purpurea.

Found near London.

Sp. 58. *Pter. microcerus*. Fem. *Cupreo-viridis*, P. incito *simillimus sed augustior, antennis pedibusque fuscis, femoribus viridibus, alis limpidis*.

Cupreo-viridis, parùm nitens: caput thorace paullò latius: oculi obscurè fuscì; antennæ fuscæ, graciles, corporis triente vix longiores; articulus 1^{us}. fulvus, 2^{us}. viridi-fuscus: abdomen cupreo-viride; segmenta posticè cupreo-purpurea: pedes pallidè fuscì; coxæ et femora viridia; hæ apice flava; meso- et metapedum

tibiæ apice tarsique flava, hi apice fuscæ; protibiæ et protarsi subtus fulva: alæ limpidæ; squamulæ et nervi fulva, illæ anticæ fuscæ; stigma pallidè fuscum, parvum. (Corp. long. $1\frac{1}{4}$ lin.; alar. $1\frac{1}{2}$ lin.)

Var. β.—Meso- et metatibiæ obscurè fuscæ.

June; New Forest, Hampshire.

Subdiv. 5^a. Fem.

Corpus mediocre, non elongatum: antennæ ejus dimidio longiores: abdomen ovatum, thorace non aut vix longius.

Sp. 59. Pter. repandus. Fem. *Viridis, antennis fuscis, pedibus flavis, alis limpidis.*

Viridis: caput thorace latius: oculi obscurè rufi: antennæ fuscæ, graciles; articulus 1^{us}. flavus: thorax brevis: abdomen nitens, parvum, thorace vix longius; discus obscurè purpureus: pedes lætè flavi; coxæ virides; genua, meso- et metatarsi pallidè flava, hi apice fuscæ: alæ limpidissimæ; squamulæ et nervi pallidè flava, illæ anticæ fulvæ; stigma fulvum, minutum. (Corp. long. $\frac{3}{4}$ lin.; alar. $1\frac{1}{4}$ lin.)

Var. β.—Æneo-viridis: abdomen cyaneo-viride; discus purpureus: meso- et metatarsi apice fulvi.

Var. γ.—*Var. β.* similis: abdomen viride; discus purpureus: stigma flavum.

Found near London.

Sp. 60. Pter. latifrons. Fem. *Viridis, antennis nigris, pedibus fuscis, alis limpidis.*

Obscurè viridis, parùm nitens: caput thorace paullò latius: palpi fuscæ: oculi obscurè rufi: antennæ nigræ, crassæ; articulus 1^{us}. flavus, apice fuscus: abdomen cupreo-viride, thoracis longitudine, angustum; discus obscurè purpureus: pedes fuscæ; coxæ æneo-virides; tibiæ pallidè fuscæ, apice basique flavæ; protibiæ, genua, meso- et metatarsi flava, hi apice fuscæ; protarsi fulvi: alæ limpidæ; squamulæ et nervi flava, illæ anticæ fuscæ; stigma fuscum, parvum. (Corp. long. 1 lin.; alar. $1\frac{1}{4}$ lin.)

Found near London.

Sp. 61. Pter. quadrinota. Fem. *Cupreo-viridis, antennis nigris, pedibus fulvis, alis fusco bimaculatis.*

Cupreo-viridis, brevis, obscurus: caput thorace paullò latius: oculi obscurè fuscæ: antennæ nigræ; articulus 1^{us}. fulvus apice fuscus:

thorax brevis, convexus: abdomen purpureo-cupreum, nitens, thoracis longitudine, acuminatum, non attenuatum; segmentum 1^{um}. cupreo-viride: pedes fulvi; coxæ æneo-virides; femora obscure fusca; meso- et metapedum tibiæ apice basique, genua et tarsi flava, hi apice fulvi: alæ ferè limpidæ, minimè fulvescentes; maculis quæque 2 fuscis, quarum una ubi costam nervus attingit, altera sub stigma; squamulæ et nervi fulva, illæ anticè fusæ; stigma pallidè fuscum, parvum. (Corp. long. $\frac{3}{4}$ lin.; alar. 1 lin.)

September; Isle of Wight.

ART. XLVI.—*Notice on the Entomological Peculiarities of Van Dieman's Land; being Extracts from a Letter by Thomas Winter, Esq. Communicated by WILLIAM SWAINSON, Esq.*

SIR,—Among the circumstances which evince that a more enlarged and philosophic spirit of inquiry has arisen in the minds of our entomologists, is their increased attention to *generals*, rather than an exclusive devotion to *particulars*. The animals of distant regions are not only sought after, but it has at length been found that great interest attaches also to the physical peculiarities of the districts they inhabit, as exercising a powerful influence on the local distribution both of genera and species. Unfortunately, however, this sort of information can only be acquired by personal research; and naturalists, in a foreign country, are usually so absorbed in the fascinating occupation of collecting, that they are generally unmindful of the localities and situations where their different acquisitions are procured. Hence, while our cabinets are daily augmented by new or undescribed species, our knowledge of entomological geography is quite in its infancy. With a view to stimulate the attention of such of our *brethren of the net*, who reside abroad, to circumstances of this nature, and at the same time to contribute something towards so desirable an object, I beg to inclose you the following short notices, written by my friend, Thomas Winter, Esq. now resident in Van Dieman's Land, a gentleman who devoted much of his leisure to entomological pursuits when in his native country,

and from whom I still hope to receive some valuable information upon subjects slightly touched upon in his interesting communication.

Yours, &c.

WILLIAM SWAINSON.

*Tyttenhanger Green, St. Alban's,
15th Nov. 1834.*

“The southern half of the island of Van Dieman, in its natural state, is a continued series of hill and dale, covered with what is here called *bush*; so that very little level or clear land is to be seen. These hills, moreover, are generally well rounded, and so much alike, that the scene wants variety; besides which, the foliage is invariably of a very sombre hue, approaching nearly to black: this dark colour is to be attributed to the trees, in general, being evergreens, and but few of them have a much lighter shade, even in their spring-shoots. The ‘bush’ varies a good deal in its character in different parts; the most beautiful is when the trees and shrubs are so scattered on hilly ground, as to leave the appearance of a park.

“In other parts the wildness of the scene (the same that it has been for ages) though cheerless to the settler, is interesting to one unaccustomed to see an inch of ground unoccupied; and this wildness is much added to, by the great quantity of old decayed timber¹ which is lying about in all directions, completely bleached, and assuming all sorts of shapes. In other parts, the bush resembles an old ragged forest thickly timbered with decayed trees. In a wild country like this, for the most part in a natural state, we should expect to meet with trees in the greatest beauty, luxuriating in their natural soil, and growing as if complete lords of the creation; at least, such was what I was led to expect; and I was therefore disappointed and astonished to find that frequently, for many acres together, it would be difficult to find a sound and perfect tree more than ten or fifteen years old. They are generally hollow, ragged, and unhealthy in appearance, while I have seen patches from one to two miles long and perhaps half a mile wide, full of trees standing, but completely dead and white. This is a strange mortality, which has occurred chiefly within the last eight

¹ Surely this “old decayed timber” must contain Coleopterous insects.

years, and cannot be accounted for, unless by the numerous fires that have been made over the whole country in order to help to clear the timber and rough long grass. These dead patches look dreary in the extreme, and one or two which were partially cleared, called forcibly to my mind the sketch of a back settlement in Mrs. Trollop's work. Even where the mortality has not been so general, it is usual to see about one third of the trees dead, while even those which are alive look like ghosts, from shedding their bark each year, which hangs about them in rags, and leaves them always nearly white.

"The absence of underwood is another peculiarity here, for I have seen none whatever, although in some parts there are '*scrubs*' which it is almost impossible for a dog to get through; these, however, are scarce, and only found in wet land.

"When I first came here, I took up my abode a mile out of town, in the midst of a large garden surrounded by a farm, from the edge of which rise uncultivated hills, covered with trees, shrubs, and coarse grass. In such a spot, in the middle of spring, I concluded that I should soon fill my insect boxes; and you may imagine how much I was disappointed when, on making my first evening rambles, I scarcely found a single insect, with the exception of ants and grasshoppers, which, together with flies, always abound. In vain I searched the foliage for caterpillars and beetles, and equally in vain did I illuminate my window for moths; I could meet with nothing, and gave up the attempt in despair. I soon after made an excursion into the country, and was riding about for a fortnight, but noticed a similar scarcity of animal life; and I frequently rode for hours through an uncultivated country without seeing a living thing, although I kept a sharp look out. I attribute much of this scarcity to the fires that rage during our dry season, destroying all vegetation, with the exception of the highest trees, for many miles in extent; indeed, so numerous are these fires, that I have considered it probable that the whole of the inhabited districts are burnt occasionally; and since these occur during the summer, the destruction of insects and of birds' nests must be very great.

"Nevertheless, as the summer advanced, a large quantity of small Coleoptera made their appearance about the trees; of moths and butterflies I still found but few; and such a deficiency was there of large and handsome insects, that my mania for

collecting never rose above the many obstacles that came in my way, and consequently I have done but little: the chief reason is, that the middle of the day has been wholly occupied by business, and, except in the sunshine, I could never find many specimens. As for birds, I believe there is a considerable variety in the interior, but in this neighbourhood there are hardly any."

"All our trees are more or less punctured by small insects, which cause upon the leaves and branches the most extraordinary deformities that I ever saw;—are such formations worth collecting, or of any use to naturalists? Although I at present feel disposed to make botany my principal study, I shall by no means neglect zoology, when I have opportunity of prosecuting that study; for I am fully aware that no one branch of Natural History can be followed up closely without bringing the observer continually in the way of kindred sciences."

ART. XLVII.—*Private Lives of Insects.* By RUSTICUS,
of Godalming.

"Once more upon the waters."—BYRON.

SIR,—Here I am, safe and sound, scribbling away in the sanctum, and "once more upon the waters" of public opinion, far more dangerous and deceptive than those of the Mediterranean—your readers don't see the gist of the comparison, and it's quite as well. Dear, delightful readers, how do you all do? In this table-drawer is a packet; ah! there it is. This packet contains eleven newspapers, all folded up so as to exhibit—ah! it is not worth mentioning, only it makes one feel a little somebodyish, that's all; for one of them, three months old, I gave eighteenpence, because the man said it broke a file:

I don't believe it could, for it's as soft as a rag. So you would not have my log? and in lieu thereof, you bestow upon your readers some abominable Sapphics of your own, and try to palm them off on me: it's all very well! About the turnip fly:—the farmers here have tried salt with great success this year, but I believe the crop has failed nowhere, so we must not make too sure. So the Entomological Society is going to

premium-ize essays on the turnip fly. I think mine contains all that is known on the subject;—I don't say this as a boast, but because mine is genuine experiment; and though the Society may write and write till Cockneyland is drained of ink, they can't experiment; they can't live six or eight years in the country; they can't trace the grub upwards from the eggs, as I have done, watching them shift their skins, and go through every process: they can't do this; the essays, though ever so ingenious, must be smoke, because the means—the capability—there's a word!—of observation, is not within their reach. Yet the Society is right in this, right at bottom; but who are to be the judges? I'll tell you, Mr. Editor; the judges will be persons who don't know a turnip flea or a turnip by sight, unless they see the latter at a greengrocer's, or on the table; and these persons will decide on the essays by the length thereof, and the learning thereof, and the one that is most profound, and most above their comprehension, will receive the prize. But gently! the Society means well, and I leave no safe ground for these comments. I know neither the proposer nor the writer, nor the judge of the prize; for decency sake, I suppose these to be two persons at least. I shall certainly come to the Society's meeting when they are to be read; in the mean time, I will hint to the candidate for fame that the eggs are *not* laid on the seed, as I once supposed. All this is a preface to two little stories.

Private Life of the Burying Beetle.

Ever since I first wore that garment, which in this privileged country is supposed to imply that the wearer thereof is, or is to be, one of the lords of the creation, the house and premises situate to the west of Godalming, and extending from the town to the Gill property at Eshing, have been known by the name of Godbold's: before that great era in the affairs of men, when it pleased my mother to clothe me in the noble garb before alluded to, it was denominated Oglethorpe's. On these subjects, bursting, as they seem to be, with all those *factelli*, or little facts, which make a story pleasant, I must be silent for the present; the only object I have in mentioning Godbold's, is to say that it was there I watched the manœuvres of the burying

beetle. Waring Kidd had shot a bulfinch, but it was spoiled for stuffing, and thrown down as useless by the side of the path just by the bath. Waring Kidd, the prince of bird-stuffers, the man who not only puts wires and cotton wool into the birds, but life and sight, and motion and music! that figure of speech is, I believe, termed hyperbole! It was on this bulfinch, and in this situation, that I had the pleasure of seeing the burying beetle at work.

Two days after, I was again in Godbold's; and seeing the bulfinch lie where he had been left, I lifted him up by a leg, intending to make a present of him to a fine colony of ants established a little further on, in the days of General Oglethorpe, and which had maintained their station ever since. They had made many a pretty skeleton for me, and I intended to add that of a bulfinch to the store, but the buzz of a beetle round my head caught my ear; he flew smack against the bulfinch which I was holding up by the leg, and fell at my feet. I knew that the gentleman was a burying beetle, and as I put the bird down for him, he soon found it, mounted upon it, and, after much examination, opened out his wing cases, and flew away. I will profit by his absence, to tell you a bit of his history.

The burying beetle is about an inch in length; he is black, with two bands across his back of a bright orange-colour; these bands are formed by two blotches of orange-colour on each of the wing-cases: he is a disgusting creature, though in such a gay dress, being^{*}so fetid, that one's hands smell for hours after handling him; and if he crawls on one's coat, or other garments not often washed, the smell continues for days. The whole tribe of burying beetles lay their eggs in the bodies of dead animals, which, when possible, they bury for the purpose. In Russia, where death itself does not do away with distinctions, the poor people are buried but a few inches under ground, the coffin consisting of four boards roughly nailed together, and not particularly well fitted; the operation of burying is often at the expense of the country, and therefore done from necessity, not love. This mode affords great pleasure to the burying beetles, as it saves them the labours of the gravedigger. They avail themselves of the bodies placed so nicely within their reach, and the graves are pierced with their holes in every direction; at evening hundreds of these beetles

may be seen in the Russian burying-places, either buzzing about the graves, or sitting placidly at the mouths of their burrows, which lead into them.

The burying beetle in this country seldom finds so convenient a provision for him, and he is under the necessity of taking much more trouble; he sometimes avails himself of dead dogs or horses, but these are far too great rarities to be his constant resort. The common objects of his search are dead mice, rats, birds, frogs, and moles; of these a bird is the most commonly obtained. In the neighbourhood of towns, every kind of garbage that is thrown out attracts these beetles as soon as it begins to smell; and it is not unusual to see them settling in our streets, enticed by the grateful odours of such substances. The burying beetles hunt in couples, male and female; and when six or eight are found in a large animal, they are almost sure to be males and females in equal numbers. They appear to hunt by the nose only, their movements being mostly made in the night, when the faculty of sight is of but little service.

Now to the bulfinch: the beetle soon returned with his bride. Neither seemed at first to discover the exact spot; at last the male espied it, and great comfort he expressed, wheeling in circles about eighteen inches above it, in the manner of an eagle, only some half dozen miles nearer the earth: the female settled on it at once, without this testimonial of satisfaction. The male at last settled also, and the bird underwent the scrutiny of four at least of the senses—touch, smell, sight, and taste—for the heads of both were continually diving among the feathers of the bird, and a savoury and ample meal was made before the great work of burying was begun. After the beetles had appeased the calls of hunger, the bird was abandoned for a while, both of them examining, with great care, the earth all round, to see whether it was a decent place for the funeral. Being satisfied as to the decorum of the thing, the operation of burying was commenced by the male; the lady mounting the bird, and for a time sitting quietly upon it, then hiding herself among the feathers, and allowing herself to be buried with it. The male began by digging a furrow all round the bird, at the distance of about half an inch, turning the earth outside; his head was the only tool used in this operation; it was held sloping outwards, and seemed prodigiously powerful.

After the first furrow was completed, another was made within it, and the earth was thrown into the first furrow; then he made a third furrow, but this was under the bird, so that I could only see a bit of him now and then, and I could only judge for a long time of what was going on by the heaving of earth, which formed a little rampart round the bird. As the rampart rose, the bird sank. After three hours' incessant labour, the beetle emerged, crawled on the bird, and took a survey of his work. Here he remained about an hour, still as death—he did not stir hand or foot; he then dismounted, dived again into the grave, and kept on pulling the bird down by the feathers for half an hour: its own weight seemed to sink it but very little. The earth then began heaving and rising all round; it was for all the world like a little earthquake: the feathers of the bird were again pulled, and again the bird descended. At last, after about three hours' more labour, he came up, mounted on the bird, took a survey, and then dropped down to rest as though dead, or suddenly fallen fast asleep. When sufficiently rested, he roused himself, trod the bird firmly into its grave, pulled it by the feathers this way and that way, and, having settled it to his mind, began to shovel in the earth: this he did in a very short time, by means of his broad head. He went behind the rampart of earth, and pushed it into the grave with amazing strength and dexterity, his head being bent downward at first, and then the nose chucked up with a kind of jerk, which sent the earth forwards. After the grave was thus filled up, and the earth trodden in, it underwent another keen scrutiny all round, the bird being completely hidden; he then made a hole in the still loose earth, and having buried the bird, and his own bride, next buried himself.

The female burying beetle lays her eggs in the carcase of the bird, in number proportioned to its size; when this operation is over, and the pair have eaten as much of the savoury viand as they please, they make their way out, and fly away in quest of further adventures. The eggs hatch in two days, and produce flat, scaly grubs, which run about with great activity. These grubs grow excessively fast, and very soon consume all that their progenitors had left. As soon as they are full grown, they leave off eating, and, burrowing deeper in the earth, change to chrysalises. The length of time they remain in this state I don't know; but when changed

to beetles, they make round holes in the ground, from which they come forth.

Private Life of the Coccus of the Vine.

One of your correspondents asked a question, some time ago, about the coccus of the vine, and in asking, mentioned a circumstance of which I was then ignorant, and of which I believe many are still ignorant, for I have never seen it elsewhere in print; that out of the coccus there comes a multitude of little red spiders. I have since attended to these cocci, and compiled their history. Here it is:—

Our vines are often annoyed, and sometimes rendered barren, by an insect which is called the vine-gall, or vine-coccus. The harm it does the vines is by pricking holes in the rind, and thereby letting out the sap, or, as the gardeners scientifically term it, making the vines bleed. Our climate is not hot enough for this insect to breed very fast out of doors; but in hothouses it thrives and swarms, often doing great mischief. Sometimes there are such hosts of them, that the young shoots are covered with a white cotton, which is in reality a resinous gum, produced by the cocci. The coccus pierces the bark by means of a sharp and long sucker, which goes to the very centre of the shoot, causing the sap instantly to flow in abundance. This piercing apparatus, although, like other insects' mouths, in the head, is bent so far under the breast, that it appears to proceed from that part, and I find has been often so described. The cocci in the young, or larva state, are all alike; they look just exactly like little tiny tortoises fixed to the rind, and sometimes leaves, of the vine. Like other animals, the cocci are males and females; the males are desperate rovers. When they are tired of vegetating, they push a hole through the back of their tortoise-like shell, and fly away; the females undergo no change in form on coming of age, nor do they ever break loose from their moorings.

The male and female coccus are very different not only in size, but make: the male is a small, active, two-winged fly; the female is a large, lazy, and almost lifeless lump, ten times the size of the male, and so closely attached to the rind of the young shoots on which she feeds, that you cannot get her away without killing her. When the female has attained this

immense size, and her whole body is full of eggs, she begins laying them, her body being glued down all round at the edges to the rind of the twig; but between her body and the rind, except just round the edges, is a quantity of cottony gum, spread over the whole space which she covers. The laying of eggs is on a different system to that of any other insect: the first egg is laid in the cottony substance without causing any disturbance to the margin of her body glued to the rind; it does not stick like most other insects' eggs, but lies quite loose in the cotton; then another is laid, which pushes the first a little forwards; and then another, and another, none of them being visible from without; so that all the eggs that the female coccus lays, she sits on, for all the world, like a broody old hen.

The female coccus, like a good many other insects, when come of age, is a complete bag of eggs. Now you will observe, that as she lays them, and then pushes them under her body, they must raise up the under skin of her body into a manifest concavity; so that the body itself daily gets thinner and thinner, while the pile of eggs which it covers gets thicker and thicker. At last the eggs are exhausted; the under skin of the body meets the upper skin, and grows hard and fast against it; then the old lady dies, and her body, like the roof of a house, protects the inhabitants below from the inclemency of the weather. In a few days from the death of the mother, the eggs hatch, and become lively little runners, of a bright red colour. These first devour the cottony stuff among which they were born; then they manage to lift up the edge of their covering, and away they run, helter-skelter. This active life lasts but a short time: they soon get hungry, pierce the rind of the twigs, anchor themselves by the beak, settle down to serious eating, and become fixtures for life. Yours, &c.

RUSTICUS.

Godalming, 17th Oct. 1834.

P. S. At one time I resolved not to touch on any subject previously related by Kirby and Spence, and until the present letter I believe I have not. I now have altered my mind. I shall in future draw no such line, but go to work armed with the instructions which they give me: where they have told

all, I shall be silent; where I find they have told but part, I shall add my mite. By a comparison of the two histories above, it will be evident that the excellent "Introduction" has been consulted; or if not evident, I do not desire to conceal the fact.

ART. XLVIII. — *Entomological Notes.* By EDWARD
NEWMAN.

(Continued from p. 315.)

CLASS.—HYMENOPTERA.

NATURAL ORDER.—APATHITES, *Newman.*

GENUS.—MELECTA, *Latreille.*

It is pleasant to create a smile; and I anticipate that many smiles will be accorded me when I coolly assure your readers, that I am going to make six distinct species out of *Melecta punctata*, and that I cannot, for the life of me, tell to which of these the name *punctata* properly belongs, and therefore have given it to neither. It is pleasant to see one's new species given, without comment, as synonyms; and when this happens, and happen it certainly will to my *Melectæ*, I hope I shall take it as good-humouredly as Mr. Waterhouse did, when he beheld his fourteen new *Notiophilæ* con-signed to utter oblivion.

All my pretty ones?
Did you say *all*? What! *all*?
What! *all* my pretty chickens
At one fell swoop?

In these cases there is this comfort, that if the new-made species are really species, they will in the course of time be re-admitted: allow a year for each really new species parted from an old one; then the *Notiophilæ* will be re-admitted by the year 47, and the *Melectæ*—for I reckon them already struck out—by the year 41.

1. Melec. Tisiphone. *Nigra; corpore, lateribus fusco-cinereo obscure punctatis; capite, tibiisque totis nigris.*

Entirely black, with the exception of obscure lighter markings on the side of the metapodeon and octoon; and two minute cinereous spots on the ennaton within its lateral margin.

Taken in the New Forest, Hampshire, by Capt. Blomer, and obligingly lent to me by Mr. Shuckard.

2. Melec. Megæra. *Nigra; corpore, lateribus obscure albido punctatis, capite nigro, meso- et metatibiis extrorsum fusco-cinereo obscure punctatis ad basin.*

Black: head posteriorly is slightly tinged with fusco-cinereous; scutum of the prothorax, anterior portion of the scutum, and the pleura of the mesothorax with a fusco-cinereous pilosity: on the sides of the metapodeon and octoon are cinereous pilosities, two minute cinereous spots on the ennaton and decaton, within their lateral margin; on the exterior part of the middle and hind tibiæ is an obscure fusco-cinereous mark at the base.

Taken in Herefordshire, in company with *Andrena tibialis*.

3. Melec. Alecto. *Nigra; corpore lateribus obscure fusco-cinereo punctatis; capite fusco-cinereo; mesotibiis extrorsum fere omnino fusco-cinereis.*

Black: head with the clypeus, cinereous; the posterior portion adjoining the prothorax clothed with a fusco-cinereous pilosity: prothorax and scutum of mesothorax fusco-cinereous; scutellum of mesothorax, metathorax, and propodeon black, with black pilosity; lateral portions of these segments clothed with fusco-cinereous pilosity; anterior margin and sides of the propodeon, and octoon, clothed with fusco-cinereous pilosity; the ennaton and decaton each with two minute whitish spots considerably within the lateral margin: middle tibiæ, with the exception of a very small space at each end, fusco-cinereous.

Taken at Epping, Wandsworth, Deptford, &c.; discovered by Mr. Shuckard to be parasitic on *Anthophora Haworthana*.

4. Melec. Clotho. *Nigra; corpore lateribus cinereo punctatis; capite fusco-cinereo; meso- et metatibiis extrorsum cinereo obscure punctatis ad basin.*

Black: head, particularly the clypeus, clothed with a cinereous pilosity; scutal and lateral portions of the pro- and mesothorax

cinereous; scutellum of mesothorax, metathorax, and propodeon black; lateral portions of propodeon cinereous; sides of metapodeon and octoon with cinereous pilosity in distinct patches; the ennaton and decaton each with two white spots considerably within the margin; middle and hind tibiæ with a cinereous mark at the base externally.

Taken round London; is parasitic on *Anthophora retusa*.

5. Melec. Lachesis. *Nigra; corpore, lateribus albo octomaculatis, capite nigro, hirsutie cinereo, clypeo argenteo; tibiis extrorsum argenteo maculatis ad basin.*

Black: head with a cinereous pilosity posteriorly, and also between the antennæ; clypeus of a silvery whiteness; prothorax and mesothorax anteriorly cinereous; the portion of the latter between the squamulæ perfectly black; metathorax and propodeon black, the side of the latter cinereous; metapodeon and three following segments with a bright, decided, and somewhat quadrate white spot on each side: all the tibiæ with a bright white spot at the base exteriorly.

Taken at Darent and Birch Woods, Kent; Dinmore Hill, Herefordshire; on a bank, in company with females of *Eucera Longicornis*.

6. Melec. Atropos. *Nigra, hirsuta; corpore, lateribus albo decem-maculatis; capite nigro, clypeo argenteo; tibiis extrorsum cinereo punctatis ad basin.*

Black, very hairy: head with a cinereous pilosity; clypeus and basal joint of the antennæ clothed with hair of a silvery whiteness; prothorax and anterior portion of mesothorax clothed with long cinereous hair; metathorax and propodeon black, sides of the latter slightly cinereous; anterior half of the metapodeon cinereous: this and the four following segments have a bright elongate white spot on each side: all the tibiæ, with the basal portion, cinereous externally: body very short and robust, nearly spherical.

Taken at Leominster, Herefordshire; and near London.

Mr. Kirby describes three of these species in his excellent *Monographia Apum*; the one which he has figured appears to me the *Alecto* of the above series; and Mr. Curtis's beautiful figure represents a variety of *Lachesis*.

NATURAL ORDER.—CYNIPITES, *Newman*.

GENUS.—FIGITES.

Fig. Syrphi. *Niger*; *tibiis, tarsi, antennisque medio piceis*.

Brilliant shining black: antennæ, with the basal and second joint, black; the four following joints pitchy red, and the apical portion black; the tibiæ and tarsi are pitchy red; the wings transparent, slightly suffused with brown, darker across the middle; their expansion is about four lines; the length of the body is about two lines.

This species does not quite agree with Latreille's description of *Figites Scutellaris* of Rossi, and Mr. Walker tells me that he thinks it is not that species; I have therefore ventured to describe it previously to making the following note. I do not recollect ever seeing any printed account of the economy of this genus, and I believe it is generally concluded that *Figites*, like *Cynips*, is a maker of galls, but this conclusion does not seem founded on observation. I was examining a fine bed of stinging nettles with Mr. Ingall, in September last, in order to find the pupæ of *Atalanta*, which abounded there; we observed numbers of the larvæ of *Syrphus Ribesii* feeding very quietly on *Aphites*. Mr. Ingall called my attention to one of the larvæ, which appeared to have something unusual attached to it; in trying to part this *something* from the larva, I drew out a Hymenopterous insect of considerable magnitude, but unfortunately had handled it so roughly as to spoil it for a cabinet specimen. The next day I observed another of the larvæ in the same plight, and determined to watch the progress of events. I had the satisfaction to see a beautiful *Figites* emerge from the back of the larva, its head being towards the larva's tail; when it was quite disengaged, the poor *Syrphus* still retained life, though reduced to little more than skin. As soon as the *Figites* had expanded and dried his wings, and prepared for flight, I secured him.

CLASS.—LEPIDOPTERA.

NATURAL ORDER.—PAPILIONITES, *Newman*.

GENUS.—POLYOMMATUS.

From examining specimens of *Polyommatus Agestis* from different localities, I have arrived at a conclusion which will

not, I fear, be coincided with by many of our Lepidopterists. On the South Downs of Sussex and Kent, *Agestis* assumes what may be called its typical form. I have taken it at Ramsgate, Dover, Hythe, Hastings, Rye, Brighton, Worthing, Little Hampton, Chichester, Portsmouth, Isle of Wight, Dorsetshire, Somersetshire; and throughout this range it is very similar: then, going upwards, I have met with it at Worcester, Birmingham, Shrewsbury; and here an evident change has taken place, the band of rust-coloured spots has become less bright; at Manchester these spots have left the upper wing almost entirely; at Castle Eden Dean they are scarcely to be traced, and a black spot in the centre of the upper wing becomes fringed with white, in some specimens it is quite white; the butterfly then changes its name to *Salmacis*. We proceed further northwards, and the black pupil leaves the eyes on the under side, until at Edinburgh they are quite gone; then it is called *Artaxerxes*. The conclusion I arrive at is this, that *Agestis*, *Salmacis*, and *Artaxerxes*, are but one species.

ART. XLIX.—*On the Description of Species.* By the Rev. G. T. RUDD, M. A.

MUCH discouragement often impedes the first steps of the young and ardent collector, from the difficulty he experiences in satisfactorily determining the name of an insect he may capture or possess, in consequence of the vague manner in which the description of it is, too often, drawn up:^a from the same cause, great and constant perplexity in nomenclature embarrasses the more advanced and practised entomologist. Whoever sits down to investigate and “make out” individuals of a genus in which the described species are numerous, will soon discover the unsatisfactory progress he can attain, the uncertainty in which he remains, after the most careful study of his author as to the specific types to which his several specimens are to be referred.^b And whenever any particular group becomes the subject of a monograph, we find the writer

^a Kirby's *Monog. Apum Angliæ*. Gyllenhal's *Insecta Suecica* must be excepted.

^b The Genera *Harpalus*—*Amara*—*Cercyon*—*Aleochara*, &c. of “*The Illustrations*,” for examples.

of that monograph expressing the difficulties he encountered in assigning to some or many of the previously-recorded species their proper places, in consequence of the insufficient descriptions of the authors who had characterized them.^c As a knowledge of species is a necessary basis on which a more scientific structure must be raised, and as every writer on species wishes his labours to result in the instruction of those for whose information they were directed, it becomes important that the descriptions employed should be so accurate, and drawn with such care, that the entomologist may gain, with *certainty* and *facility*, an acquaintance with those objects he desires to recognize, and understand fully the distinctions that separate the species of a genus from each other. Whoever, therefore, undertakes to write a monograph, or to describe species, ought to be perspicuous and simple in his descriptions, employing terms generally received and understood, *and defining such characters only as will at once distinguish the individual from which they are drawn from each and all of its congeners*. If he separates his insects, and raises them to the rank of species on trifling differences, which it requires "an empirical tact to discover," it will no doubt be difficult for him to express, in definite terms, such slight modifications of variation; indeed a very fair question will be raised, how far he is warranted in assigning to such slight differences an amount of value sufficient to determine that they are specific; but if, uninfluenced by the paltry desire of detecting new species, he has proceeded with caution, and has divided one insect from another on INTELLIGIBLE *appearances* of dissimilarity of form, sculpture, size, or colour, he can with accuracy define in words what those visible differences are, and thus convey to his reader a clear idea of the *peculiar distinctive* characters which *mark* each supposed species. B will then be easily recognized from A, — C from A and B, — D from E, — F, G, and H from each other, and from A, B, C, D and E. The business of a describer is, I conceive, to "define differences," and that so clearly, that if an entomologist has but a single species in his collection belonging to the genus described, he may be enabled, on referring to the monograph, to identify it, or to satisfy himself it is unnoticed. It not unfrequently

^c See Entom. Mag. Vol. II., pp. 254—259.

occurs that a writer distinguishes one species from another, in his specific character, by terms of comparison, as "larger or less," "broader or narrower," "smoother or more punctured," &c. &c. "than the preceding," or than some other; a mode of description vague and unsatisfactory, and obviously useless in all cases where the investigator does not possess "the preceding" or the standard of comparison, a case of constant occurrence. Such a mode of description ought to be avoided. It is no doubt true that perfectly distinct species are so closely allied, that the line of separation is but slender; still, slender as it may be, it must be such as is capable of being expressed in words, and it is the more necessary to use great care in *giving prominence* to the definition of this *slight character*. I am well aware how trite these observations are, and how forcibly they have been expressed in your first volume; but so long as we find they are neglected by writers, it cannot be unnecessary to call their attention to them. A hint may be of value,—it may induce future describers to look carefully to the execution of the task they undertake, so that their labours may be as useful and as highly esteemed as their intentions are laudable. I would entreat them to weigh well the admirable observation—"Character non est ut genus fiat, sed ut genus dignoscatur." If they desire a model, let them imitate the unequalled Monog. Apum Angliæ of the venerable, the beloved Kirby; or the justly popular work of the distinguished Gyllenhal.

ART. L.—*Descriptions of some British Species of Anacharis.*

By FRANCIS WALKER.

ANACHARIS,^a *Dalman*.—(*Hymenoptera Cynipites*.)

Corpus angustum, convexum, atrum, nitens, læve, compactum, parçè et breviter hirtum: caput mediocre, transversum, subquadratum, thorace paullò latius, sulculis posticè transversis; vertex inter ocellos elevatus: oculi mediocres, laterales, globosi, obscurè rufi: ocelli in triangulo supra verticem positi; medius paullulum ante laterales prostans: mandibulæ mediocres, arcuatæ, dentibus magnis acutis
 ♂ armatæ: maxillæ longæ, graciles, subarcuatæ; lacinia acumi-

^a Ἀνὰ, retrò; κείρω, abscindo.

natae, lobatae; palpi 4-articulati, graciles, longitudine mediocri; articuli 1^{us}. et 2^{us}. mediocres, lineares, subaequales; 3^{us}. longicyathiformis, intus apice angulatus, 2^o. paullò brevior; 4^{us}. subfusiformis, 3^o. longior et gracilior: labium longum, angustum, ferè lineare; ligula brevis, lata, integra; palpi 3-articulati, breves, clavati; articuli 1^{us}. et 2^{us}. graciles, lineares, hic brevissimus; 3^{us}. longi-ovatus, crassus, 1^o. longior: antennae articulis *mar*i 14, *fem*. 13, corporis circiter longitudine, graciles, filiformes, pilis brevissimis hirti; articuli 1^{us}. et 2^{us}. nitidi, glabri, hic subrotundus parvus, ille validus basi gracilior; 3^{us}. et sequentes ad postremo proximum graciles, filiformes, longitudine gradatim decrescentes; ultimus subfusiformis, paullò longior: thorax ovatus, altus, posticè angustior, subtus et utrinque punctatus striatus parùm nitens: prothorax minimus, supra vix conspicuus: mesothorax maximus; scuti parapsidum suturae benè determinatae, punctatae, posticè mutuo accedentes; paraptera et epimera conspicua; scutellum subrotundum, extans, basi utrinque impressum, apice abruptè declive: metathorax mediocris, obscurus, scaber, declivis: petiolus gracillimus, teres, glaber, metathorace infimo insertus, longitudine varius: abdomen longiovatum, glabrum, acuminatum; segmenta 6 transversa parallela conspicua, basale magnum, sequentia ad ultimum gradatim decrescentia; segmenta ventralia laminâ angustâ occulta: oviductus brevis, abdominis apicem non transiens: pedes longi, graciles, simplices, recti, pilis brevissimis hirti; tibiae apice bispinosae; protibiae spina unica longa valida curva armatae; tarsi articulis 1^o. ad 4^{um}. longitudine decrescentibus; 5^{us}. 4^o. longior; ungues et pulvilli parvi: protarsi articulo 1^o. subtus inciso: alae mediocres, subtilissimè pubescentes, pili inter costam et nervum 1^{um}. longiores: proalae nervis 4; 1^{us}. s. longitudinalis alae basi emergens, subcostam spatio excurrens, dein abruptè flexus illam attingens et alae apicem accedens; 2^{us}. s. transversus basalis 1^o. subcostali excurrente decedens, in alae discum rectè declivis et desinens; 3^{us}. s. transversus medius 1ⁱ. angulo progreditur, in alae discum excurrit ubi 4^o. s. extimo transverso recurrente jungitur et conficitur: metalae nervo unico subcostali simplici.

Fem. antennae breviores articulo ultimo crassiore, petiolus brevior, abdomen longius et acutius.

Anacharis has many characters, which together distinguish it from the other genera of *Cynipites*; among these, are—the filiform and slender antennae, about as long as the body; the scutellum smooth and shining, neither gibbous nor acuminate, perpendicular behind, so as to form a right angle when viewed sideways; the long slen-

der polished petiole; the oval compact abdomen; the short concealed ovipositor, and the few and clearly defined nervures of the wings. It differs very much from *Cynips* in the structure of the abdomen, and the nervures of the wings, and has more resemblance to *Figites*; but the latter has the antennæ formed differently, the scutellum tuberculate, the petiole very short, the abdomen compressed, and the nervures of the wings generally more developed. There are some species which will form a new genus: they have thicker antennæ than *Anacharis*, and a rough, punctured, and much shorter petiole, &c. The latter are not uncommon on hedges and lime trees, &c. during the summer and autumn; they run very rapidly, and are probably parasitic.

Sp. 1. *Ana. tinctus*. Mas et Fem. *Petiole abdominis circiter longitudine, pedibus fulvis aut flavis, alis minimè fulvo tinctis, nervis ferrugineis, extimo piceo.*

Ater aut æneo-ater: antennæ nigræ, subtus nigro-piceæ: petiolus *mari* abdominis longitudine, *fem.* paullo brevior: pedes fulvi; coxæ nigræ; metatrochanteres piceæ; metafemora a basi ferè ad apicem ferruginea; ungues, pulvilli et metatarsi fuscii: alæ hyalinæ, minimè fulvotinctæ; squamulæ et nervi ferruginea; nervus extimus transversus crassus, piceus. (Corp. long. $1\frac{3}{4}$ —2 lin.; alar. $2\frac{1}{4}$ — $2\frac{1}{2}$ lin.)

Var. β .—Mas, antennæ nigro-piceæ, subtus ferrugineæ; articuli 1^{us}. et 2^{us}. nigri: metafemora omninò fulva.

Var. γ .—Fem. antennæ piceæ, subtus ferrugineæ; articuli 1^{us}. et 2^{us}. nigri.

Var. δ .—Fem. antennæ fulvæ, apice fuscæ; articulus 1^{us}. niger, 2^{us}. piceus: pedes flavi; coxæ nigræ; tarsi apice, ungues et pulvilli fuscii; metatarsi fuscii, basi fulvi: alæ nervo longitudinali basi flavo.

July; near London. September; Isle of Wight; Machynlleth, North Wales.

Sp. 2. *Ana. typicus*. Mas et Fem. *A. tincto similis, petiolo brevior.*

Ater aut æneo-ater: antennæ nigræ, subtus piceæ: petiolus longitudine $\frac{2}{3}$ abdominis: pedes flavi; coxæ nigræ; metatrochanteres piceii; *fem.* metafemora basi ferruginea; tarsi apice ferruginei; metatarsi *mari* ferruginei, *fem.* fuscii; alæ subhyalinæ, nonnunquam minimè fulvo tinctæ; squamulæ et nervi ferruginea; nervus

longitudinalis basi flavus; nervus extimus transversus crassus, piceus. (Corp. long. $1\frac{1}{2}$ — $1\frac{3}{4}$ lin.; alar. 2— $2\frac{1}{4}$ lin.)

Var. β.—*Mas*, metafemora basi ferruginea; metatarsi fusci: alæ nervo longitudinali omninò ferrugineo.

Var. γ.—*Mas*, antennæ piceæ, subtus ferrugineæ.

Var. δ.—*Mas*, metatrochanteres ferruginei.

Var. ε.—*Fem.* antennæ nigro-fuscæ, subtus pallidiores: metafemora omninò flava; metatarsi ferruginei.

July and August; near London. June; Isle of Wight.

Sp. 3. *Ana. eucharoides*. *Mas et Fem.* *A. typico similis sed brevior, alæ albo-limpidæ.*

Cynips Eucharoides. *Dalman Act. Holm.* 1818. I. 78. 2.
Anacharis Eucharoides. *Dalman Analecta Entomologica*, 95. 6.

Ater aut æneo-ater: antennæ nigro-piceæ, subtus pallidiores; articuli 1^{us}. et 2^{us}. nigri: petiolus abdominis dimidio longior: pedes flavi; coxæ nigrae; metatrochanteres picei; tarsi apice ferruginei; metatarsi fusci, *fem.* basi flavi: alæ albo-limpidæ; squamulae et nervi ferruginea; nervus longitudinalis basi flavus; nervus extimus transversus crassus, piceus. (Corp. long. 1— $1\frac{1}{4}$ lin.; alar. $1\frac{3}{4}$ —2. lin.)

Var. β.—*Mas et Fem.* antennæ articulo 2^o. piceo: metapedum trochanteres et tarsi fulvi.

Var. γ.—*Fem. Var. β.* similis: antennæ articulis 3^o. ad 13^{um}. fulvis.

June; near London; Windsor Forest; Isle of Jersey.
September; Isle of Wight.

Sp. 4. *Ana. immunis*. *Mas. Præcedenti similis; petiolus multò brevior.*

Ater: antennæ nigro-piceæ, subtus pallidiores; articulus 1^{us}. ater: petiolus abdominis dimidio brevior: pedes flavi; coxæ nigrae; metatrochanteres piceæ; metafemora basi ferruginea; tarsi apice et metatarsi omninò pallidè fusci: alæ limpidæ; squamulae et nervi ferruginea; nervus longitudinalis basi fulvus; nervus extimus transversus crassus, piceus. (Corp. long. $1\frac{1}{4}$ lin.; alar. 2 lin.)

Var. β.—Abdomen subtus fuscum: pedes flavi; coxæ nigrae.
Nuper perfectus?

July; near London.

Sp. 5. *Ana. ensifer*. Mas et Fem. *Præcedentibus omninò diversus; petiolus brevior; abdomen compressum.*

Ater: antennæ nigræ, subtus nigro-piceæ; articuli 1^{us}. et 2^{us}. omninò nigri: petiolus abdominis triente brevior: abdomen *fem.* præsertim angustum, compressum: pedes rufi; coxæ nigræ; metapedes picei, tibiis rufis apice ferrugineis; *fem.* mesopedes et profemora rufo-picea: alæ albo-limpidæ; squamulæ et nervi ferruginea; nervus extimus transversus mediocris, piceus. (Corp. long. $1\frac{1}{4}$ — $1\frac{1}{2}$ lin.; alar. 2— $2\frac{1}{6}$ lin.)

Var. β.—Fem. pedes rufi; coxæ nigræ; metapedes ferruginei; trochanteres et tarsi picei.

June; near London; Windsor Forest.

It resembles a *Figites* in the shape of its abdomen.

ART. LI.—*Notice of Entomological Works.*

1. *British Entomology*, by John Curtis. Nos. 127 to 132. *July to December, 1834.*

2. *Illustrations of British Entomology; by J. F. Stephens. Nos. LXV. to LXVIII.*—The author, on the wrapper, announces his intention of completing the work in 24 additional numbers, making the whole work to consist of 14 volumes. In the 9 volumes already before us, the *Coleoptera* and *Lepidoptera* are not yet complete, and no other class is begun. We hope that Mr. Stephens will allow at least an equal space to *Hymenoptera* and *Diptera*, which contain as many species as the two classes he has described; and the *Orthoptera*, *Hemiptera*, and *Neuroptera*, cannot be completed in less than one volume; appendix and tables must take another small volume, thus allowing 20 volumes for the whole work. We assert, without hesitation, that the subject cannot be *well* treated in less, and we are very sorry to hear of this proposition for curtailing the part which is to come. The plan of the work may probably have been too diffuse; but we think it should be continued in the present style, or otherwise the work abandoned when the classes in hand are completed. In the latter case, it will be a

complete and invaluable work; and if not perfect, it is at least as perfect as the present state of the science can make it: it will be a monument of industrious research, and a credit not merely to the individual, but to the country which has produced it.

3. *The London and Edinburgh Philosophical Magazine and Journal of Science. Third Series. No. 25. July 1834.*—In this number are characters of several undescribed species, and of one new genus (*Neriene*) of *Araneidæ*; by John Blackwall, Esq.

4. *Etudes Entomologiques; par M. de Laporte. Livraison 1. Paris, 1834.*—In this work the author proposes a new arrangement of insects, of which the following is the outline:—

A. Mandibulata.

- 1 Order Isoptera (part of Neuroptera of Authors).
- 2 — Hymenoptera.
- 3 — Strepsiptera (Stylops).
- 4 — Neuroptera (part of Neuroptera of Authors).
- 5 — Arkiptera (part of Neuroptera of Authors).
- 6 — Dermaptera (Orthoptera of Authors).
- 7 — Coleoptera.

B. Haustellata.

- 8 — Hemiptera (Hemiptera Heteroptera).
- 9 — Homoptera (Genus Cicada, *Lin.*).
- 10 — Gynaptera (Genus Aphis).
- 11 — Phauloptera (Genus Coccus).
- 12 — Aptera (Anoplura, *Leach*).
- 13 — Siphonaptera (Genus Pulex).
- 14 — Diptera.

5. *Recherches pour servir à l'histoire et à l'anatomie des Phryganides; par François Jules Pictet. Genève, 1834. 20 Plates.*

Our illustrious countryman, the late Sir Humphry Davy, instituted a prize for the encouragement of the physical and natural sciences at Geneva; this prize is allotted to the work before us, which has our unqualified approbation. It contains a history of all preceding works on this tribe; also, figures and descriptions of their external and internal anatomy, and of the species, with many of their larvæ and pupæ, &c. found in the basin of Geneva.

6. *Abbildungen zur Berichtigung und Ergänzung Schmettenlingkunde, besonders der Microlepidopterologie, &c. herausgegeben von J. E. Fischer. 1 Heft. mit 5 illuminirten Kupfern. Leipzig, 1834.*—Intended for a supplement to Treitschke's and Hübner's European Lepidoptera, and containing illustrations of the *Tortricites* and *Tineites*, with their larvæ and pupæ: the figures are well coloured.

7. *Die Schmetterlinge von Europa (Fortsetzung des Ochsenheimerschen Werks), von Friedrich Treitschke. Neunter Band. Leipzig, 1832 & 33.*

8. *Deutschlands Fauna, &c. von Jacob Sturm. V. Abtheilung, Die Insecten. Achtes Bändchen. Käfer. Mit 18 illuminirten Kupfertafeln. Nürnberg, 1834.*

9. *De Gammari Pulicis Fabr. Historia Naturali atque sanguinis circuitu commentatio, auctore J. C. Zenker. Accedit Tabula ænea. Jenæ, 1832.*

10. *Beiträge zur Naturgeschichte der Rankenfüßer (Cirripeda). Von Hermann Burmeister. Mit zwei Kupfertafeln. Berlin. 1834.*

11. *Jahrbücher der Insectenkunde, mit besondern Rücksicht auf die Sammlung im Königl. Museum zur Berlin herausgegeben von Dr. F. Klug. Erster Band. Mit 2 illuminirten Kupfertafeln. Berlin, 1834.*

12. *Coléoptères du Mexique; par A. Chevrolat. Fascicules 1 et 2. Strasbourg, 1834.*

13. *Histoire Naturelle des Lépidoptères Rhopalocères ou Papillons diurnes, des départemens des Haut-et Bas-Rhin, de la Moselle, de la Meurthe et des Vosges, publiée par L. P. Cantener. Livraisons 1 et 2. Paris, 1834.*

14. *Abhandlungen der Königlichen Akademic der Wissenschaften zu Berlin. Aus dem Jahre, 1832. Bericht. über eine auf Madagascar veranstaltete Sammlung von Insecten aus der Ordnung Coleoptera. Von H^r. Klug. Berlin, 1834.*

15. *Faune Entomologique de Madagascar, Bourbon et Maurice. Lépidoptères, par le Docteur Boisduval. Avec des notes sur les mœurs, par M. Sganzin, Livraisons 1—8, Paris.*

16. *Hymenopterorum Ichneumonibus affinium, Monographiæ, Genera Europæa et species illustrantes. Scripsit C. G. Nees ab Esenbeck Dr. Volumen Primum. Stuttgartiæ et Tübingæ, 1834.*

17. *Catalogue des Coléoptères de la Collection de M. le Comte Dejean, Livraison 3. Paris, 1833.*

18. *Die Wanzenartigen Insecten. Getreu nach der Natur abgebildet und beschrieben von D. Carl. Wilh. Hahn.; Erster Band, 5, 6 Hefte. 1833. Zweiter Band, 1—4 Hefte. Nürnberg, 1834.*

19. *Die Arachniden. Getreu nach der Natur abgebildet und beschrieben von D. Carl. Wilh. Hahn.; Zweiter Band, 2, 3 Hefte. Nürnberg, 1834.*

20. *Genera et species Curculionidum, cum Synonymia hujus familiæ; a C. J. Schænherr, &c. Tomus II. Pars 2. Parisiis, 1834.*

21. *Iconographie du Règne Animal de M. le Baron Cuvier; par M. F. E. Guérin. Paris. Livraisons 35 et 36. Insectes, pl. 32, 33, 34, 35, 49, bis, 50 et 66.*

22. *Monographie des Cétoïnes, et Genres voisins, &c.; par M. H. Gory, et M. A. Percheron. Livraisons 4—6. Paris, 1833.*

23. *Iconographie, &c. des Coléoptères d'Europe; par M. le Comte Dejean, et M. le Docteur J. A. Boisduval. Tome IV. Livraisons 3, 4, 5 et 6.*

24. *Magasin de Zoologie; par F. E. Guérin. Paris, 1833, 1834.—With figures and descriptions of several insects; among them *Trochalonota* and *Malagocaster*, two new genera*

of *Coleoptera*; also observations on the *Melasomata*, by M. Guérin, who announces that he is about to publish a complete monograph on that family of *Coleoptera*.

25. *Revue Entomologique, publiée par Gustave Silberman. Strasbourg. Livraisons 9 et 10. 1834.*—The Chief essay in these numbers is entitled “Observations critiques sur la synonymie des Carabiques, par M. Aug. Brullé.”

26. *Annales des Sciences Naturelles. Tome Premier. Zoologie Février et Mars. Paris, 1834.*—Among the entomological articles, are continuations of the two essays which we mentioned in p. 317 of our last number.

27. *Annales de la Société Entomologique de France. Tome III. Trimestres 1, 2 et 3. Paris, 1834.*—The classification of *Cerambycidæ*, by M. Audinet Serville, is here concluded. These numbers also contain, 1. A long essay on the *Serricornes*, or *Elateridæ*, and neighbouring genera, by the late Latreille. 2. On the species of *Coccus* which inhabit the environs of Aix, by M. Boyer de Fonscolombe. 3. Observations, by the same author, on the genera *Lithurgus* and *Phylloxera*; the latter a new genus allied to *Aphis*. One species is described (*P. Quercus*) which is gregarious in all stages of growth, beneath the leaves of oak trees in Provence. 4. An excellent monograph of the *Rhipiceridæ*, by M. F. de Laporte, whose Monograph of the *Diaperidæ* and Essay on the *Hemiptera*, &c., have already placed him high among all entomologists. 5. Catalogue of the *Lepidoptera* of the department of Lozère, by M. Duponchel. 6. Observations on the tribe of *Hydrophilidæ*, by M. Solier. 7. On two new species of *Ichneumonidæ*, the one parasitic upon the larva of *Myrmeleon formicarium*, the other on *Barynotus elevatus* and *Otiorhynchus lignarius*, by M. Boudier. 8. On the *Platyomidæ*, or *Tortricites*, by M. Duponchel. 9. An essay on the *Coleoptera Heteromera*, by M. Solier, &c.

28. *Histoire Naturelle des Lépidoptères, ou Papillons de France, par Godart, continuée par M. Duponchel. Tome IX. Nocturnes; Tome VI., livraison 2. Supplément, &c.; Tome I. livraisons 15 et 16. Paris.*

29. *Iconographie des Chenilles, &c.; par M. Duponchel. Tome I. Livraison 10. Paris.*

30. *Icones Historiques des Lépidoptères nouveaux ou peu connus; par le Docteur Boisduval. Livraisons 25 et 26. Paris.*

31. *Collection Iconographique et Historique des Chenilles, &c.; par MM. Boisduval, Rambur et Graslin. Livraisons 23 et 24. Paris.*

32. *Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou. Tome III. Moscou, 1834. Notice sur quelques Lépidoptères des Antilles, avec la description de plusieurs espèces nouvelles, par M. Menetries.*

33. *The management of Bees,; &c. by Samuel Bagster, jun. Bagster: London, 1834.*—This is the most complete, concise, and interesting history of bees that we have ever met with: the author gives us no great deal of his own, but in his selections and quotations from the highest authorities in apiarian lore he has shown great judgment. The work is illustrated with numerous *good* wood-cuts, and an excellent coloured plate, from a drawing by Mr. Charles Curtis. We have lately been so talkative on bees that we must not say more at present, or our readers will think us infected with a bee-mania.

34. *Sketch of the Natural History of Yarmouth; by C. J. and James Paget. Longman: London, 1834.*—An interesting and meritorious publication, and one which has given us much pleasure. All *local lists* are very valuable, but—we wish we had never to use *buts*—there is a fault in all *local lists* that we have seen; it is this: there is a difficulty in getting the rarer species named at a distance from London, and therefore these go unnamed, and make no appearance in the list. The same objection we made to Mr. Wilson's *Entomologia Edinensis*, and in making it we were a little misunderstood. Mr. Wilson, doubtless, in his researches, met with many species which it was difficult or impossible to identify; now these were the very insects about which an entomologist would have felt interested.

we doubt not that the insects described are natives of the Edinburgh district, but they are, nearly all of them, distributed over the kingdom, and, probably from the greater number of entomologists, seem to be remarkably abundant in the London district: we therefore felt disappointed. We perfectly agree with *all* of Mr. Swainson's remarks at p. 439.

35. *The Grammar of Entomology ; by Edward Newman. Westley and Davis : London, 1835.*—This work has long been the chief *desideratum* in Entomology. We have seen it in sheets, and shall simply announce the plan on which it is written, by giving its contents. It is divided into four books; each book is introduced with an engraving by Mr. Ingall.

BOOK I.—HISTORY OF INSECTS.

Chapter I. History of Insects in general.—II. Silkworm.—III. Apple-Moth.—IV. Mosquito.—V. Bot.—VI. Bee.—VII. Ichneumon.—VIII. Burying Beetle.—IX. Apple Weevil.—X. Earwig.—XI. Locust.—XII. Coccus.—XIII. Hop-fly.—XIV. Ant-lion.—XV. White Ant.—XVI. Concluding Observations.

BOOK II.—PHYSIOLOGY OF INSECTS.

Chapter I. Physiology of Insects in general.—II. Organs of Support in general.—III. Organs of Support in the Head.—IV. Of the Wings and Legs.—V. Of the Characters of Surface.—VI. Of Muscles.—VII. Of Nerves.—VIII. Of the Alimentary Canal.—IX. Of the Organs of Circulation.—X. Of the Organs of Respiration.—XI. Concluding Observations.

BOOK III.—CLASSIFICATION OF INSECTS.

Chapter I. Classification of Insects in general.—II. Classification of Lepidoptera.—III. Diptera.—IV. Hymenoptera.—V. Coleoptera.—VI. Orthoptera.—VII. Hemiptera.—VIII. Neuroptera.—IX. Concluding Observations.

BOOK IV.—PRESERVATION OF INSECTS.

Chapter I. Apology for the Collector of Insects.—II. Dress and Instruments of the Collector.—III. On Capturing Insects.—IV. On Killing and Setting Insects.—V. Entomological Cabinets.—VI. Entomological Books.—VII. Entomological Investigations.—VIII. Entomological Societies.

36. *Lardner's Cabinet Cyclopædia*. No. LIX. *A Preliminary Discourse on the Study of Natural History*, by William Swainson, Esq. London: Longman, 1834. Every naturalist should possess this work.

ART. LII.—Varieties.

47. *Addendum to Mr. Bird's communication at p. 39.*—SIR, In looking at my contribution to the volume of the Entomological Magazine completed with the present number, poor as the contribution is, it may be worth while to correct what is wrong, and to add something to it.—P. 42, line 1. "Those which I do not take by the lamp." I intended to limit this to the class, *Lepidoptera*.—P. 43. In the list of *Coleoptera*, *Callistus lunatus* should be omitted; I take it at Caversham, seven miles off, on chalk. In the list of *Diptera*, I ought to have inserted *Chironomus æstivus*. ♂ During the present year, I have added to the Burghfield insects *Tipula nigra*? *Notodonta perfusca*, *Clostera reclusa*, *Sesia Bombyliiformis*, and *Nonagria crassicornis*. I have taken a few specimens of *Grammesia bilinea*, *Argyrolepia Turionella* and *Sargus Reaumuri*. *Cynthia Cardui* has been very common here. We have seen a few specimens of *Colias Electra*.

Burghfield,
13th October, 1834.

Yours, &c. C. S. BIRD.

48. *Capture of Deilephila Celerio and D. Galii.*—I have had the good fortune to procure this autumn a specimen of each of these rare British *Sphingites*. *Galii* was taken on a major convolvulus about the middle of the ninth month (September), in a sort of court-yard; there was no other plant near it. *Celerio* was taken on a heap of stones early in the tenth month (October), and brought to me alive. Four specimens of *Colias Hyale* have been taken here this autumn by different collectors.

Brighton,
24th Nov. 1834.

ISAAC GRAY BASS.

49. *Query respecting Hyale and Lathonia.*—SIR, Can you inform me what authority Mr. Standish has for saying that

Hyale and *Lathonia* have been taken this year in Northumberland? I am pretty sure that I know all the collections in the county, and have never heard of such captures; indeed, I think them extremely improbable. I have both insects from the south of England.

Newcastle,
14th October, 1834.

GEORGE WAILES.

50. *Colias Europome* again. — SIR, In a list of Worcestershire *Lepidoptera*, prepared by an excellent and most indefatigable naturalist, Mr. Edwin Lees, of Worcester, and recently published in the appendix to a lecture by Dr. Hastings, occurs the following notice of this insect: "*Colias Europome* has been noticed in the meadows near the confluence of the Avon and Severn, flying with great swiftness in August, but is a rare insect." The following notices, from the same list, seem worthy of a corner in your Magazine. "*Colias Chrysotheme*.—Rare. Near Worcester, in the cabinet of Mr. A. Edmonds." "*Vanessa Antiopa*.—Very uncommon; but has been captured at Barbourne, near Worcester." "*Lycæna dispar*.—Very rare in this county: a solitary individual has been taken." "*Polyommatus Acis*.—Taken at Hawford, near Worcester, and in the Trench woods." "*Deilephila Livornica*.—Near Worcester; but rare. *D. Celerio*.—Rare." In addition to these, I may add, that a fine specimen of *Argynnis Lathonia* was taken some years back by my friend, Samuel Alexander Burlingham, of Worcester, not far from the town.

Deptford.

EDWARD NEWMAN.

51. *Nyssia zonariu*.—My brother, Benjamin Cooke, found a pupa in the sand in September, 1832, in the same locality where I have captured the moth, from which he hatched a female on the 27th of February, 1833. About the same time, a considerable number of moths were found; and during the same month of the present year I found them so abundant, that I could scarcely walk without treading on them. I have only observed them about one locality; but I think it is very probable they may be found on other parts of the coast.

Leicester,
17th Nov. 1834.

NICHOLAS COOKE.

52. *Curious economy of Gyrinus Villosus*.—The Memoirs

of the Belfast Natural History Society for January, 1834, contain a notice by Mr. Robert Patterson, V. P. of the discovery of an unusual inhabitant in a fresh water shell (*Limnæus pereger*). When the shell was taken out of the pool, its mouth was stopped with what appeared a mass of clay; but proved to be a fragment of some aquatic plant of suitable length, the space between it and the margin of the aperture being filled with slime. The interior of this mass was lined with a soft, whitish, silky substance, which extended to the margin of the aperture. The chamber was occupied by a living individual of *Gyrinus villosus*. Nothing was observed by which the object of this occupancy might be explained. A member of the Society, Mr. G. C. Hyndman, referring to the habits of *G. natator* which is transformed in a silken cocoon, suggested that the larva of *G. villosus* might have taken possession of an empty shell in which to undergo its change, and that the beetle found in it might be recently disclosed; but the fact, that the cocoon of the former is suspended above water, is unfavourable to this view.

Quære? Is this an accidental occurrence, or does it indicate a peculiarity in the habits of this Subgenus?

A. H. HALIDAY.

53. *Psychoda nervosa*.—I have bred this insect in great numbers from putrescent Boleti.

A. H. HALIDAY.

54. *Chlorops lineata*.—This insect is always very abundant in houses during the spring and autumn; but in September and October last it quite darkened the ceilings and windows in Middlesex and Hertfordshire with its innumerable hosts, and is common, even now, in December. The larva is unknown.—N.

55. *On the Husk in Cattle*.—SIR, Having a disease among my young cattle which appears but little understood, at least in this part of the country, and which threatens to be somewhat formidable in its effects, I am induced to communicate, as far as my observations enable me, although the results have not been satisfactory, some account of it; partly for the benefit of those who may have seen less, and partly to solicit information through your useful columns, from those who may have seen more of the disease than myself. It first made its

appearance among my weaning calves, from two to nine months old, twenty of which were weaned off, and seven younger ones still fed from the pail, and kept near home; both lots became affected about the same time, which is about a month since; the whole twenty-seven have had it, eight have died, some have got better, scarcely any have quite recovered; some have died in a few days, others linger for weeks. They are reared on milk, hay tea, linseed jelly, gruel made from wheat meal and pot liquor, with salt mixed, and fed three times a day.

The symptoms are, cough, (particularly when driven,) short breathing, with a discharge of frothy saliva at the mouth, dullness, and hanging of the head and ears. I first treated it for inflammation on the lungs, by bleeding, blistering the sides, and opening drenches of Epsom salts with oil. When one or two had died, I recollected having seen in the "Farmer's Journal," some years ago, an account of a disease with symptoms somewhat similar, caused by worms in the throat, and which was stated to have been cured by pouring turpentine into the nostrils. On opening those that had died, I found the worms inside the windpipe, and down into and throughout the lungs, from one to three inches long, and very white, so that when the lungs were cut open, they had the appearance of being interwoven with white thread; I examined them with a microscope, — they are somewhat like a common earthworm, but whiter. I tried several experiments as to what would kill them quickest. I found lime, salt, and spirits of turpentine, all effectual, even mixed with water; but the difficulty is getting any thing to the part so as to come in contact with the disease, the stomach and lungs being so completely separate.

Mr. White, of Wells, in Somersetshire, in his Treatise on Cattle Medicine, says, — the "hoarse or cough generally attacks calves in winter, and is caused by very small worms being engendered in the branches of the windpipe. It is sometimes cured when attended to early, but if neglected at this period, more commonly proves fatal. The remedy that has been found most effectual is a drench, composed of a table-spoonful of oil of turpentine, a little sweet oil, with six ounces of warm water, poured into the nostrils; probably the worms would be destroyed if the calf were made to breathe the vapour of oil of turpentine, or a mixture of turpentine and tar. I succeeded in one case, that was rather recent, by giving two

ounces of common salt, dissolved in water, and a moderate quantity of good hay, morning and evening. The cause is, probably, a cold moist atmosphere, and an insufficient quantity of wholesome food."

In the "Complete Grazier," a work of considerable merit, the "Cough" in calves is treated on merely as a common cough, arising from frequent colds caused by vicissitudes of the weather, and the cure recommended is "half a table-spoonful of spirit of turpentine poured into the nostrils."

Mr. Green, of Westerham, who is an experienced and practical man, says he has frequently had the disease in his cattle, and has never found any great difficulty in curing them, by giving about a quart of decoction of walnut leaves as a drench; he termed it the "Husk;" and had observed it to have been caused by worms in the lungs and windpipe. I have been trying this remedy, among others, for the last fortnight, but without the slightest appearance of success. The manner in which I did it was, to fill a copper with walnut-leaves chopped fine, then as much water as the copper would hold, boiled it for five or six hours, and gave the liquor warm to the calves; some drank it readily from the pail. I allowed some to drink from two to three quarts, and repeated it every other morning. I have persevered with the turpentine and oil, both as drenches and in the nostrils, (having plenty of subjects to experimentalize upon.) To some I have given grains of calomel; to others strong doses of sulphur; rubbing in oil of turpentine on their sides, thinking it possible it might do good by absorption, tarring the noses of all, sick or well, every two days, and giving salt frequently.

Having ascertained that a small quantity of lime would kill the worms when taken out, it struck me that if the cattle were made to inhale the particles of it when fresh slaked, it might be beneficial. I accordingly put them in a close building, put a quantity of lime on the floor, and threw a little water over it, keeping their heads over it during the emission of the gas, as long as they could bear it, and when run to powder swept and buffeted it about till some were ready to drop of suffocation; this I repeated every two days, but, (although I still have as much faith in the efficacy of this as in any remedy I have heard of,) I cannot boast of any very evident benefit from it; I think it may be possible that a sufficient quantity of the particles of lime may be inhaled, the caustic properties of which may

destroy the worms without destroying the life of the animal. I have consulted several veterinarians, most of whom appeared to think the disease in some measure infectious, but are not very well agreed as to the cause and cure. Mr. Coleman, who is perhaps considered at the top of the profession, advises the affected ones to be separated from the healthy, and recommends the smoke of tobacco to be inhaled, and to allow them oilcake to eat; he is of opinion that being kept in close stenchd places is likely to cause it; but this could not have been the cause with mine, which were weaned in April, May, and June, and have been in the fields entirely. Some think they have taken the worms from something which may have engendered them in the water they have drunk; but this could not have been the case with those still kept to the pail. Others think the worms originated from a fly, perhaps taken in with the breath; and some, even at the present day, are superstitious enough to attempt to keep off the husk by twisting a hazel withe round the necks of their cattle; this shows it to be a disease not much understood.

I have understood the disease is more prevalent this year than usual; and, as far as I am able to judge, it will not only affect the young, for I find several of my yearling heifers and milch cows have the same kind of cough; but it does not appear to take so great an effect on them as on the calves; they appear healthy, except the cough, and keep their condition.

Should any of your readers be able to furnish information as to the cause, prevention, or cure, through the medium of your paper, I feel confident it would be esteemed a favour by many, but particularly so by

Yours respectfully,

GEORGE COLGATE.

Brockley, Lewisham, Sept. 22, 1834.

[We have transferred this to our pages from the Maidstone Gazette, in order to elicit the remarks of our contributors.]—
ED.

56. *Copy of a Letter addressed to the Secretary of the Entomological Society of London.*—SIR, I beg to hand you my resignation of membership in the Entomological Society, and to state, that the reason for my doing so, is the appearance of that Society's official attack on the Entomological Magazine, in the Introduction to the Transactions. That *any* Society should deliberately and officially attack a private undertaking,

under *any* circumstances, I conceive to be a degradation to itself, and a departure from sound principle; but that a Society, which the Entomological Magazine has invariably advocated, through good report and through evil report, should turn round and attack its most *faithful* and most *sincere* friend, appears to me the height of injustice, and renders it any thing rather than an honour to be enrolled among its members. That the Society should avail itself of a jocular article published in the Entomological Magazine as the reason for the attack, makes a weak cause weaker still.

I am, Sir, your obedient servant,

Deptford.

EDWARD NEWMAN.

57. *Notes on Deilephila Euphorbiæ*.—SIR, When I presented the plates of *Deilephila Euphorbiæ*, you expressed a wish for some particulars as to its localities, &c., although these have already been given by Mr. Curtis and Mr. Stephens. In the autumn of the year 1806, I first visited the north of Devon; and at the village of Instow, opposite Appledon, the first caterpillar was brought me by a fisherman. I forwarded it to the late Professor Fuseli, keeper of the Royal Academy, &c., who considered it to be *Sphinx Kæchlini*; indeed, it is very like that insect, as figured by his brother, both in the larva and chrysalis state. See Plate 4, *Fuesly's Archives*. The larva died without changing. I know not if it may be considered foreign to my subject, if I here state, that the late Mr. F. was an enthusiastic entomologist, and had a fine collection of drawings and books of natural history, and I recollect his once chiding me for apathy, and concluded by saying, "When I was of your age, I often went, at two and three o'clock in the morning, into the corn fields and woods to collect for my brother, and many of the insects figured by him were from my drawings." And to show you that it was not quite lost in the decline of his life, I will here mention, that on the conclusion of his last Lecture, and when descending the rostrum, Mr. Cooper kindly offered his assistance, he said, "I thank you; O, is it you, Cooper? Well, where is Raddon? Has he taken *Atropos*?" He was then upwards of eighty. *Deilephila Euphorbiæ* is a very difficult insect to rear, as the following extract from a letter received from Mr. Fuseli, dated December 26, 1815, will verify:—"Of the

numerous pupæ (upwards of twenty) which you left with me, and I with Lady ———, one only has given the Sphinx, and that was a very beautiful one, of a rose-coloured hue, a variety rarely met with. The remainder of the pupæ are *in statu quo*, and I believe are well. They often take two years before they arrive at their last evolution." [The remainder died.—W. R.] About the same time, I gave Dr. Leach a number of chrysalides; but I learnt that not one produced the perfect insect. I have neither taken, nor been able to procure, a single insect, in any state, since 1819, until this year a single chrysalis, which was captured on the 3d of October, and spun itself next day into a place of rest, by attaching the dried leaves of its food together. The person who sent me this, says, "The valley in which you desired me to search is completely filled up by the sand, and the whole surface quite altered by the winds." Captain Blomer, who resided for some years near the locality, and visited it often, was not able to capture one, and Mr. Cocks, an able and very zealous entomologist of that vicinity, says, in a letter dated August last:—"It is now ten years since I took the larva; and although I have regularly been in the habit of visiting the locality every year several times, I have never been fortunate enough to take it since." That you may imagine how plentiful they were in the year 1814, I would not then capture any but what were full fed; and after one day's pursuit, I had forgotten to take any food, and was in the boat, on my return home, when I begged the boatman to put back. It was nearly dusk; I jumped ashore, and hastily cut an arm full of spurge, and at night put it into water. The next morning, on going to feed the larvæ I had brought home, I found the food was covered with, I should suppose (for I did not count them), not less than a hundred minute larvæ about a day or two old. I have thus given you my rough notes on this insect. If you think them worth an insertion in your valuable Magazine, they are at your service; and I remain

Yours most truly,

4, Trafalgar-square, Queen's Elms,
20th October, 1834.

W. RADDON.

58. *Death of Mr. Say, the American Entomologist.*—The death of this illustrious man took place on the 10th of October, 1834, in the forty-seventh year of his age, at

Harmony, in the state of Indiana. He was throughout life one of the most simple and retiring of men; his habits, mode of address, and clothing, seem to carry one back to the patriarchal ages, yet he was well informed on all subjects, and perfectly acquainted with the scientific and political events of the day. He inquired, with an eager interest, of every person capable of affording him information, and was equally willing to communicate, in the most pleasing and easy manner, any information which he possessed. He took a peculiar pleasure in instructing the young, and so managed his discourse, that even children considered him as a kind and agreeable friend, and an enjoyable companion, rather than a tutor. The *Athenæum*, of 20th December, noticing his death, gives the following extract from the *United States National Gazette*:—

“To his native genius, supported by untiring zeal and indefatigable research, the Academy of Natural Sciences of Philadelphia is indebted for its opening reputation. Mr. Say was among the earliest members, if not one of the founders, of this institution. His original communications to the Society alone, in the most abstruse and laborious departments of Zoology, Crustacea, Testacea, Insecta, &c. of the United States, occupy more than 800 printed pages of their journal. His Essays, published in the Transactions of the American Philosophical Society, the Annals of the Lyceum of Natural History at New York, in Silliman's Journal, &c. are equally respectable, perhaps equally numerous. His contributions to the American Encyclopedia, though highly valuable, are not so generally known. His separate work on American Entomology, and another on Conchology, have met with the approbation of the learned. With the brilliant results of his laborious exertions, as naturalist to the two celebrated expeditions by the authority of the United States Government, under the command of Major, now Lieut.-Colonel S. H. Long, the reading public is already familiar. Some years previously, he accompanied Mr. M'Clure, and other kindred spirits, on a scientific excursion to the Floridas. The pages of the Academy's Journal were subsequently enriched by the fruits of this undertaking. These expeditions, with occasional excursions made with similar views, in the vicinity of Philadelphia, constitute the only interruptions to a laborious course of studies, steadily and unostentatiously pursued in his native

city, in which many departments of natural science were successfully cultivated, and extensively enriched by his observations and discoveries. Our lamented friend had recently devoted much of his time to the publication of his work on American Conchology, elucidated by expensive plates. He might have continued thus usefully employed for many years, had not the climate on the Wabash proved injurious to his health. He repeatedly suffered from attacks of fever and dysenteric affections, by which a constitution originally robust and inured to hardship materially suffered. A letter announcing the sad catastrophe, which deprived society of one of its worthiest members, and science of one of its brightest ornaments, informs us, that Mr. Say suffered another attack of this disorder similar to that by which his constitution had already been shattered, about the 1st of October; on the 8th, the hopes of his friends were flattered by a deceitful calm; on the day following, these hopes were chilled; he appeared sinking under debility; when, on the 10th, death came over him like a summer cloud. He died intestate, and without issue, but left with his wife verbal directions relative to the final disposition of his library and cabinet of natural history." Our readers who are acquainted with the present state of society in America, who know that the spirit of the United States is essentially commercial, not scientific, will see much to admire in the course of Thomas Say, and will not fail to join with us in shedding a tear of sympathy on his early grave.

59. *Brachinus crepitans*.—I was wandering with Mr. Marshall over the chalky fields in the neighbourhood of Box-hill, in September last, when we found that almost every flint contained beneath it specimens of *Brachinus crepitans*. As I put them, one after another, into my spirit bottle, the little bombadiers fired away, as they sank in the spirits, each about four "pops," every pop being easily felt, like a slight electric shock, by the hand which grasped the bottle; a small bladder of air ascended with every pop. We hunted most assiduously for *Licinus*, without finding a single specimen of either species. Mr. Bennett, who had been over the ground a fortnight before, was equally unsuccessful in this respect.

E. N. D.

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LEUCOPSIS *Fabr.*

gigas Fabr.
nigricornis Del.
intermedia Ill.
varia Klug.
Biguetina Jur.
dorsigera Fabr.
SMIERA *Spin.*
nigrifex Sulg.
sispes Linn.
subpunctata Guild.
fulvescens Guild.
EPITRANUS *Walk.*
fulvescens Guild.
CHALCIS *Fabr.*
femorata Panz.
flavipes Latr.
distinguenda Del.
tibialis Del.
annulipes Del.
cingulata Del.
minuta Linn.
podagrica Fabr.
vicina Del.
parvula Del.
HALTICELLA *Spin.*
pusilla Fabr.
HOCKERIA *Del.*
bispinosa Fabr.
bifasciata Del.
hetera Del.
nigra Del.
nigripes Fons.
rufipes Oliv.
unicolor Walk.
NOTASPIS *Walk.*
formiciformis Guild.
DIRHINUS *Dalm.*
cornigerus Jur.

APHIDIUS *Ess.*

Crepidis Hal.
constrictus Ess.
pictus Hal.
Pini Hal.
infulatus Hal.
Laricis Hal.
Rosæ Hal.
lutescens Hal.
Arenæ Hal.
Ervi Hal.
Urticæ Hal.
Asteris Hal.
Ribis Hal.
Cirsii Hal.
Eglanteriæ Hal.

Salicis Hal.
leucopterus Hal.
Matricariæ Hal.
Arundinis Hal.
fumatus Hal.
exiguus Hal.
ambiguus Hal.
ephippium Hal.
dissolutus Hal.

PSILUS *Jur.*

fucicola Walk.
FIGITES *Latr.*
subapterus Walk.

CEROCEPHALA *West.*

cornigera West.
formiciformis West.
MACROGLENES *West.*
oculatus West.
ASAPHES *Walk.*
vulgaris Walk.
ISOSOMA *Walk.*
flavicolle Walk.
SYSTOLE *Walk.*
platytera Walk.
EURYTOMA *Ill.*
acuminata Del.
squamea Del.
rufitarsus Del.
Salicis Del.
flavipes Del.
DECATOMA *Spin.*
semifasciata Del.
flavicollis Walk.
MONODONTOMERUS *West.*
obsoletus Fabr.
cereus Del.
DIOMORUS *Walk.*
nobilis Walk.
CALLIMOME *Spin.*
inconstans Del.
lateralis Del.
rufipes Del.
compactus Del.
confusus Del.
ORMYRUS *West.*
tubulosus Fons.
PERILAMPUS *Latr.*
nitens Del.
antennatus Del.
violaceus Panz.
auratus Panz.
splendidus Dalm.
lævifrons Dalm.
DIPARA *Walk.*

LIST OF GENERA AND SPECIES.

cinetoïdes *Walk.*
MERISUS *Walk.*
splendidus Walk.
ORMOCERUS *Walk.*
latus Walk.
simplex Walk.
vernalis Walk.
maritimus Walk.
MICRADELUS *Walk.*
rotundus Walk.
GLYPHE *Walk.*
autumnalis Walk.
GASTRANCISTRUS *West.*
fuscicornis Walk.
compressus Walk.
tenuicornis Walk.
vagans West.
viridis Walk.
atro-purpureus Walk.
laticornis Walk.
tenebricosus Walk.
fumipennis Walk.
unicolor Walk.
obscurus Walk.
vulgaris Walk.
terminalis Walk.
annulipes Walk.
crassus Walk.
angulus Walk.
acutus Walk.
MEROMALUS *Walk.*
flavicornis Walk.
RHAPHITELUS *Walk.*
maculatus Walk.
PSILONOTUS *Walk.*
adamus Walk.

MELIGETHES *Kby.*
nigra Newm.
CATHERETES *Kby.*
glabra Newm.
MICROPEPLUS *Latr.*
obtus Newm.
TRICHOPTERYX *Kby.*
Titan Newm.
ATOMARIA *Kby.*
gutta Newm.
CRYPTOPHAGUS *Herb.*
scutellatus Newm.
TETRATOMA *Herb.*
picta Newm.
RHYZOPHAGUS *Herb.*
collaris Newm.
RHYZOPERTHA *Steph.*
cincta Newm.
RIPIPTERYX *Newm.*
marginatus Newm.

LEUCOSPIS *Fabr.*
gigas Klug.
Shuckardi West.
subnotata West.
Hopei West.

Spinola West.
assimilis West.
Sicelis West.

MIRAX *Hal.*
rufilabris Hal.
ACÆLIUS *Hal.*
Germanus Hal.
subfasciatus Hal.
MICROGASTER *Latr.*
Mediator Hal.
spectabilis Hal.
ingratus Hal.
infumatus Hal.
russatus Hal.
globatus Linn.
annulipes Cur.
Spinola Hal.
meridianus Hal.
messorius Hal.
luctuosus Hal.
alvearius Fabr.
consularis Hal.
flavipes Hal.
calceatus Hal.
equestris Hal.
albipennis Hal.
infimus Hal.
candidatus Hal.
xanthostigma Hal.
lacteipennis Cur.
annularis Hal.
decorus Hal.
hilaris Hal.
contaminatus Hal.
arenarius Hal.
sodalis Hal.
dilectus Hal.
Conifera Hal.
exilis Hal.
umbellatarum Hal.
lateralis Hal.
vitripennis Hal.
callidus Hal.
exiguus Hal.
fulvipes Hal.
popularis Hal.
immunis Hal.
glomeratus Linn.
placidus Hal.
lineola Cur.
præpotens Hal.
intricatus Hal.
vestalis Hal.
ruficrus Hal.
gracilis Cur.
rubripes Hal.
prætextatus Hal.

PIPUNCULUS *Latr.*
maculatus Walk.
sylvaticus Meig.
geniculatus Meig.

LIST OF THE GEERAN AND SPECIES

flavipes Meig.
 pratorum Fall.
 campestris Latr.
 modestus Hal.
 ruralis Meig.
 auctus Fall.
 CHALARUS Walk.
 spurius Fall.
 holosericeus Meig.

SELADERMA Walk.

lætum Walk.
 bicolor Walk.
 convexum Walk.
 breve Walk.
 SEMIOTUS Walk.
 mundus Walk.
 clarus Walk.
 tarsalis Walk.
 Scoticus Walk.
 varians Walk.
 præstans Walk.
 diversus Walk.
 quadratus Walk.
 mærens Walk.

SYSTASIS Walk.

encyrtoides Walk.
 tenuicornis Walk.

EUNOTUS Walk.

cretaceus Walk.

MERAPORUS Walk.

graminicola Walk.

alatus Walk.

exiguus Walk.

METASTENUS Walk.

concinus Walk.

METOPON Walk.

atrum Walk.

PLATYTERMA Walk.

nobile Woll.

laticorne Walk.

teliforme Walk.

prasinum Walk.

cincticorne Walk.

terminale Walk.

AMBLYMERUS Walk.

amænus Walk.

dubius Walk.

validus Walk.

ERISTALIS Fabr.

stygius Newm.

PSEUDOPSIS Newm.

sulcatus Newm.

PLATYTERMA Walk.

incultum Walk.

comptum Walk.

femorale Walk.

decorum Walk.

remotum Walk.

AMBLYMERUS Walk.

ruralis Walk.

campestris Walk.

latus Walk.

truncatellus Walk.

fulvipennis Walk.

modestus Walk.

fuscipes Walk.

humilis Walk.

albitarsus Walk.

nitescens Walk.

pusillus Walk.

tenuicornis Walk.

hebes Walk.

tenellus Walk.

fulvipes Walk.

stupidus Walk.

manus Walk.

linearis Walk.

temperatus Walk.

iners Walk.

trossulus Walk.

stenomerus Walk.

tenebricus Walk.

mirus Walk.

PLATYMESOPUS West.

tibialis West.

MESOPOLOBUS West.

fasciiventris West.

EUTELUS Walk.

dilectus Walk.

immaculatus Walk.

signatus Walk.

pygmæus Walk.

diffinis Walk.

jucundus Walk.

placidus Walk.

ocellus Walk.

eximius Walk.

platycerus Walk.

bicolor Walk.

platynotus Walk.

sobrinus Walk.

catenatus Walk.

inornatus Walk.

fulvicornis Walk.

flavipes Walk.

æquus Walk.

planus Walk.

gracilis Walk.

helvipes Walk.

posticus Walk.

elevatus Walk.

intermedius Walk.

semotus Walk.

altus Walk.

chlorospilus Walk.

fuscipennis Walk.

politus Walk.

vagens Walk.

PYGOSTOLUS Hal.

sticticus Fabr.

ANCYLUS Hal.

muricatus Hal.

DESCRIBED IN THIS VOLUME.

lituratus *Hal.*
 excrucians *Hal.*
 edentatus *Hal.*
 CENTISTES *Hal.*
 cuspidatus *Hal.*
 LEIOPHRON *Nees.*
 mitis *Hal.*
 pallipes *Cur.*
 picipes *Cur.*
 accinctus *Hal.*
 similis *Cur.*
 intactus *Hal.*
 fulvipes *Cur.*
 pallidistigma *Cur.*
 apicalis *Cur.*
 EMBOLEMUS *West.*
 CINETUS *Sw.*
 ISMARUS *Hal.*
 MIRAX *Hal.*
 Spartii *Hal.*

MEGISTOCERA *Wied.*

dispar *Walk.*
 TIPULA *Linn.*
 ramicornis *Walk.*
 LIMNOBIA *Meig.*
 vicaria *Walk.*
 CTENOPHORA *Meig.*
 vilis *Walk.*
 bella *Walk.*
 BIBIO *Geof.*
 imitator *Walk.*
 PSILOPUS *Meig.*
 cingulipes *Walk.*
 tricolor *Walk.*
 connexus *Walk.*
 THEREVA *Latr.*
 misella *Walk.*
 BRACHYOPA *Hoff.*
 rufocyanæa *Walk.*
 HELOPHILUS *Meig.*
 griseus *Walk.*
 ANTHRAX *Fabr.*
 extensa *Walk.*

PTEROMALUS *Swed.*

cavus *Walk.*
 decedens *Walk.*
 perversus *Walk.*
 patulus *Walk.*
 extensus *Walk.*
 amplus *Walk.*
 catillus *Walk.*
 latus *Walk.*
 domesticus *Walk.*
 sylvicola *Walk.*
 discus *Walk.*
 gynetus *Walk.*
 bracteatus *Walk.*
 herbicus *Walk.*
 lucidus *Walk.*
 aspilus *Walk.*

flammiger *Walk.*
 conspersus *Walk.*
 oxygyne *Walk.*
 megachlorus *Walk.*
 grandis *Walk.*
 aurifer *Walk.*
 robustus *Walk.*
 nubilus *Walk.*
 perfectus *Walk.*
 apertus *Walk.*
 dives *Walk.*
 cuprinus *Walk.*
 obtusus *Walk.*
 curtus *Walk.*
 pinguis *Walk.*
 chalceus *Walk.*
 brevicornis *Walk.*
 despectus *Walk.*
 affinis *Walk.*
 fumipennis *Walk.*
 redactus *Walk.*
 epistenus *Walk.*
 purpureus *Walk.*
 semifascia *Walk.*
 venustus *Walk.*
 anticus *Walk.*
 varius *Walk.*
 rufinus *Walk.*
 sequester *Walk.*
 saturatus *Walk.*
 futilis *Walk.*
 decorus *Walk.*
 famulus *Walk.*
 perpetuus *Walk.*
 viridulus *Walk.*
 tenuis *Walk.*
 pexatus *Walk.*
 inops *Walk.*
 detritus *Walk.*
 inscitus *Walk.*
 tristis *Walk.*
 microcerus *Walk.*
 repandus *Walk.*
 latifrons *Walk.*
 quadrinota *Walk.*

MELECTA *Latr.*

Tisiphone *Newm.*
 Megæra *Newm.*
 Alecto *Newm.*
 Clotho *Newm.*
 Lachesis *Newm.*
 Atropos *Newm.*
 FIGITES *Latr.*
 Syrphi *Newm.*

ANACHARIS *Dalm.*

tinctus *Walk.*
 typicus *Walk.*
 Eucharoides *Dalm.*
 immunis *Walk.*
 ensifer *Walk.*

ERRATA.

- Page 14, line 10, 14, 15, page 22, line 10, 14, for *cæteri propedum* read *cæteris ut propedes*.
- 21, — 22, for *in-canaliculo* read *in canaliculo*.
- 24, — 18, 21, for *nigrificis* read *nigrifice*.
- 26, — 8, for *maris* read *mari*.
- 93, — 18, for *posticè* read *postici*.
- 96, — 18, 37, } for *substigmatè* read *sub stigmatè*.
- 97, — 14, }
- 149, — 6, for *Cerophala* read *Cerocephala*.
- 9, for *nigro-fuscus*, *nitens*, *ferè glaber* read *nigro-fusca*, *nitens ferè lævis*.
- 151, — 22, for *coxæ* read *coxæ*.
- 163, — 30, page 164, line 27, page 165, line 29, for *sub-costam* read *sub costam*.
- 166, — 9, for *per ejus* read *ejus*.
- 177, — 4, for *cupreum*, *breve*, *crassum* read *cupreus*, *brevis*, *crassus*.
- 179, — 14, for *proalæ subcosta*, *fusco* read *proalæ sub costam fusco*.
- 194, — 30, for *immutable* read *inimitable*.
- 222, — 20, for *Ediniensis* read *Edinensis*.
- 231, — 25, } for *5-annulatum* read *6-annulatum*.
- 232, — 16, }
- 232, — 17, for *totum* read *totius*.
- 233, — 37, for *cubitali* read *radiali*.
- 234, — 6, after *retegens* insert ,
- 17, for *cuique* read *quæque*.
- 235, — 13, for *nigro-fusca* read *nigro-fusci*.—"A similar error recurs frequently."—*Mr. Haliday*.
- 245, — 2, for *latius* ; read *latius*,
- 27, 28, for *nigra*, *intermedia summo apice* ; read *nigra* ; *intermedia summo apice*,
- 248, — 9, for *variis* ; read *variis*,
- 254, — 22, for *vix* read *vix*.
- 259, — 15, after *Mer. Ins. II.* insert 43.
- 264, — 14, }
- 269, — 24, } for *connecti* read *connexi*.
- 287, — 16, for *radialis* read *cubitalis*.
- 288, — 29, for *quæque* read *quæque*.
- 305, — 23, for *claro* read *nobili*.
- 306, — 26, for *dimidio* read *dimidii*.
- 308, — 28, for *metafemora* read *mesofemora*.
- 386, — 13, for *Cecidomya* read *Cecidomyia*.
- 401, — 14, for *Rhapalum* read *Rhopalum*.
- 402, — 38, for *Xyocopa* read *Xylocopa*.
- 410, — 34, for *Trichissoma* read *Trichiosoma*.
- 415, — for *labium*, wherever it occurs, read *labrum*.
- 421, — 1, for *Cacicula* read *Cacidula*.
- 438, — 30, for *Ediniensis* read *Edinensis*.

DIRECTIONS TO BINDER FOR PLACING THE PLATES.

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